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EDITORIAL NOTES.

The War and the Industry.

BRITISH gas undertakings have only just passed through one of the most froward half years ever experienced by them, when suddenly practically the whole of Europe is plunged from a state of peace into an unparalleled vastness of war; and Great Britain is involved by it in the defence of her honour, the protection of her rights and her very existence, and the safeguarding of her future position as an influential Power among the nations. It is not our business, in an industrial and technical journal, to enter into the rights or the wrongs of the many phases of this great upheaval, and dislocation of the world's machinery; nor need we here reflect upon the terrible devastating consequences of it all. As an industry, we have lived on terms of the utmost amicability with the gas industries of other countries; the friendships between the professional men of these industries are deep and sincere; and the progressive work of each has ever been for mutual good. We have had our little rivalries for supremacy in producing the highest benefit for the gas industry the world over; but there rivalry has ended. Representatives of the gas professions of the different nations have been the guests the one of the other. A few years ago we had members of the German profession as our guests in this country; we have since been, on more than one occasion, to theirs—the hospitality has been great, the courtesy most sincere. The same with the members of the French gas profession—they have been our guests; we theirs. In the jubilee year of the Institution of Gas Engineers, we had practically all the Continental countries represented at the rejoicings, as well as at the National Gas Exhibition and Congress. We might extend the reference to the evidence of professional and industrial friendships; but what has been said suffices. The nations are at war; but, whatever the issue of the immense and stern conflict, at the end of it all it will be found that, at any rate, between the members of the gas professions of the combatant countries, the old friendships will not have weakened, but will be continued as though there had been no interruption whatever of national relationships.

However, the British gas industry has, as remarked in opening this article, just emerged from a twelvemonth's adversity, owing to the high price of coal, and the low values of, and poor markets for, residual products. With lower prices for coal, better times were looked for in the now current twelve months. War has largely eclipsed the hopes. It is true that Sir A. Markham, in the House of Commons early last week, in referring to the unwarranted raising of the prices of commodities, and speaking for one of the largest groups of mines in the country, said that on no consideration would the price of coal be raised a farthing above what it was at the present time; and he was sure that this would be the desire of all who wished well for their country. He added that the owners for whom he spoke had no intention of using the opportunity for enriching any particular section of the community. Would that the coal owners had been animated by a somewhat similar spirit at the close of the great coal war! There is, war notwithstanding, no reason why the price of coal should at present go up in price. Export to the Continent is impossible; export elsewhere is dangerous. Some British coal vessels were last week captured by Germany. Export being to a large extent impossible, there will be for a period, and for this reason, a saving of coal to the country. Moreover, many coal-using industrial establishments have closed-down, or have partially done so, owing to the three causes of a sudden cessation of demand for manufactures from abroad, of a considerable number of their employees having enrolled themselves for the defence of their country, and of the necessity for some temporary fiscal conservation. There is restriction of output of manufactures in all directions, which must not only affect the requirement for coal, but for gas and coke as well, and for the other commodities made by gas undertakings to the extent that work is curtailed in which these products are required. On the other hand, as a set-off to the conditions which will release more coal for the home markets, there are a large number of reservists and territorials among the miners who have been "called up;" so that supply through this cause will be reduced below the normal. But normal supply will not be required. In another way, several gas undertakings may be hit—those undertakings that depend on sea-borne coals. Insurances for boats and freights have been put up to almost prohibitive prices; and although the Government have decided to ensure 80 per cent. of the value of ships against war risks under protection of ships of the British fleet, the risks of seizure (and of mines) without any proper convoy do not make this means of transit a comfortable one for those who are engaged upon it. Recourse can be had to the railways. But expense any way must go up; and there can be no reliance upon the railways so far as regularity of delivery is concerned. State control of the railways now exists through an Executive Committee of the General Managers of the railways; and civil requirements have been properly subordinated to Naval and Military purposes. But, as far as possible, State and civil requirements are being co-ordinated; and ordinary facilities, though restricted, have not been interfered with more than is necessary. We cannot foresee how much or how little normal facilities will be hereafter interrupted. It is observed that the London Companies had good stocks of coal in hand at the close of the June half year. The Gas Light and Coke Company had 232,764 tons; the South Metropolitan Gas Company, 181,056 tons; the Commercial Company, 25,076 tons—the two former Companies being well in excess of the quantity at the corresponding date of last year. It must be expected, however, that, under the circumstances, there will be a little unevenness in deliveries, and that transport in these times may be somewhat more costly.

As to oil, the position is perhaps somewhat worse for undertakings that have not good stocks in hand. The Standard Oil Company announce that they have stopped all exports of petroleum and other oil products destined for Europe. There is a large use, too, in this country of gas mantles made in Germany; but we have not the slightest doubt that, despite the fact that there will be no supplies for a time from that quarter, the makers at home will be able to fully satisfy all needs. As for contracts placed in Germany or elsewhere abroad for gas plant and pipes, and (if any) for coal, delivery will have to be postponed until a more convenient season. Another strain which the gas industry will meet with the greatest composure and patriotism will be the reduction of its normal working staffs through the considerable numbers of men who will have to join the colours, or who may volunteer for service. As during the South African war, every gas company and committee will also do each its part in looking after, and guarding against the privation of, the wives and families of the men who are away serving their country, and (when the war is over) in welcoming the latter back again to their old positions. District work will also be restricted in many cases by the commandeering of the motor lorries, motor cars, and horses of gas undertakings, all of which have been, or will be, cheerfully relinquished in the country's cause. Even the new good ship *Fulgens* (the property of the Gas Light and Coke Company) started on its final journey from the North last Friday in the service of the Company before entering temporarily into the service of the State. The proprietors of gas companies may also find the payment of their half-yearly dividends deferred for a space, through the cash requirements of the country. In the hour of stern need, the industry must suffer inconveniences and do its part in common with the rest of the country. The industry will not be less resolute in facing all that it is called upon to face; and that will not be less, but perhaps more, than in the case of some other industries.

Obligations and their Fulfilment.

THE address that Sir Corbet Woodall, D.Sc., had prepared for delivery at last Friday's meeting of the Gas Light and Coke Company suffered one disadvantage, which was that, though in excellent spirits, despite the mind-disturbing circumstances of the day, he had been charged not to undergo more fatigue than was unavoidable in the way of public speaking. The address, though read by Mr. D. Milne Watson, the General Manager, with clearness and expression, lacked in its delivery the tone which an author such as Sir Corbet can best give to his own words. The Governor unsuccessfully tried to import into the address, at the very opening, a second disadvantage; but in this he signally failed. He said he must confess to a great difficulty in concentrating his observations upon the mere details of the business which brought the proprietors together, while there was so much external to the business challenging attention. The excellence of the address in interesting point indicates that, however distracting the events in the country, on the seas, and beyond, the man of affairs, through qualification, training, and habit, can detach himself for a space from even these events to give himself over to the ordinary matters of daily life. The address was filled with lessons of individual, collective, and ministerial obligation and responsibility; and there is a distinct obligation upon every one of us not to let the great outer events of the time divorce us from ordinary responsibilities, for, sure as they are allowed to do so, the country will be worse off than it otherwise would be. Only the other day the Government, or one of the Ministers of the Crown (much reading has caused us for the moment to forget which it was), urged the people of the country, in its best interests, not to let the affairs of transcending importance to the world so monopolize attention as to cause diversion from ordinary routine and conduct, as such a course would be disastrous to the homeland. We have brave men at sea and on foreign soil fighting for the honour and the present and future interests of our country; and it would ill-become us at home not to do our part to keep the great machinery of the country moving to the maximum degree so as to avert and mitigate as much as possible the distress that is bound to come, and will spread and grow heavier the longer the war lasts. There must be no slackening off anywhere where it can be avoided, and no negligence. There are an obligation and a responsibility to keep open as widely as may be the doors of employment for the people at home, even at some personal sacrifice. Whatever the curtailment of employment, let it be as narrow as possible.

We turn from the general to the particular. The proprietors of the Gas Light and Coke Company have had such a continuity of good fortune, and such an enhancing of stability the last few years under the new *régime*, that now, at the time of temporary ebb-tide, they look very complacently upon the inroads that dear coal and torpid residuals markets have made into the accumulation of the undivided profits. As rational men, they know that even an administration that has wrought such marvels in rehabilitating the concern cannot do more than work to reduce the effects of repressive conditions of external origin. There is indeed an obligation upon all gas proprietors to recognize this; and at this particular juncture, there is the further obligation upon them to realize that, under the stress of the present sudden international disturbance, there are bound to be worse times in store than even those resulting from recent conditions of the coal and residuals markets. Fortunately, the price of coal is easier. The Governor mentioned that the Company have entered into new contracts for coal at a reduction of rather more than 2s. per ton; but this is only about half the money paid per ton under the now expired contracts in excess of the price paid in 1912, and there are still the stocks to be worked out at the high prices that have been ruling. The coal-owners have not been mindful of their obligations to the country in this matter; and there is not the slightest doubt that the combined front they have shown in the work of extracting, through the power of possession, the uttermost penny for coal has had its part in bringing about, as Sir Corbet says, the decline in the commercial prosperity of the country. Such action has not the ring of patriotism about it; it has that of unadulterated selfishness. The coal-owners, however, have now done something to redeem their position in the eyes of the country by sternly setting themselves against those miners who, forgetful of their obligations to their country, recently proposed to maintain prices by the creation of artificial conditions through a restriction of output. Such clumsy ideas are more in keeping with mediæval times and methods than with those of the present century. "Patriotism," said Sir Corbet, "is much on our lips just now. It is well to recog-"nize that care for our country can be shown in more "ways than the supreme one of fighting for her."

There is administrative obligation in many directions. Illustrating one are the remarks in the address on the great fall that there has been in the realizable price for coke—a fall that is out of all consonance with the fuel value of the material relative to that of coal. The causes of the fall were set out by the Governor: The first is the larger quantity of coke produced at the collieries in improved ovens; the second, the smaller utilization of coke for carburetted water-gas manufacture, owing to the higher price of oil; the third, the reduced demand for cement making; the fourth, unwise competition for orders, "which has added nothing to "the quantity sold, while greatly reducing the revenue of "gas undertakings." The effects of improvements in processes of cement-making, or restricted demand for cement, cannot be avoided; and, in regard to the price of oil and carburetted water-gas manufacture, the industry's sails must be trimmed according to the wind. But in the other two respects, there are obligations resting upon the administrations of gas undertakings. One is where there is a local demand for metallurgical coke, and extension or reconstruction of carbonizing plant gives opportunity, to endeavour to meet it. The other is that there is every obligation upon gas undertakings to avoid the competition that the Governor speaks of, which enriches other industries at the expense of our own. The steps taken to avoid this have been partially successful; but unfortunately, only partially. Some gas undertakings are still dominated by selfishness, and operate to get rid of their own production in a manner that is little short of scandalous, to the detriment of all other neighbouring concerns. Words cannot be used that are too condemnatorily strong for some of the reports of this sort of thing that have come to our ears. However, steps are now being taken to act more in unison in this matter. In his address at the Tottenham Light, Heat, and Power Company's meeting [also reported in this issue] Sir Corbet made a feature of this particular subject of coke; and, in his address, among other phrases and truths, we have these: "Com-"binations formed for creating artificial values for any "commodity are to be heartily condemned; but, in this "case, a combination would surely be justified." "If only "every house in a gas company's district used half a ton "of coke per year, nearly the whole production would be "absorbed." It is necessary to act in combination in order that coke may have conferred upon it a position in the market commensurate with its fuel value; and a good local trading standard for which to aim (although it may be difficult of attainment) is a consumption per house equal to the answer obtained by dividing the coke produced for sale by the number of houses in an area. There we have one aspect of administrative obligation brought out.

Another has regard to the capital account. Sir Corbet referred to the matter so as to show the proprietors what had been done during the past four-and-a-half years in the case of the Gas Light and Coke Company. All the plant of a gas undertaking, from the moment it is put into active service, incurs waste and depreciation calling ultimately for renewals and reconstruction. Hence there is a danger where such waste and depreciation are not provided for. "It is not difficult to show large profits for a time by "deferring indefinitely the liquidation of such obligations. "But the result is an inflated capital, which eventually becomes ruinous." How have the present Board of the Gas Light and Coke Company discharged their obligation to the public and to the proprietors in this connection? The record is almost romantic. The balance of their capital account is only £6551 less than it was four-and-a-half years ago. Yet the output of gas has increased by 11 per cent.—in volume representing a consumption equal to that of the City of Leeds; some 167,000 have been added to the number of fires and stoves in use; and more than 100,000 consumers have had their houses equipped with prepayment meters and fittings. This all comes from statesmanlike dealings with depreciation and replacements where there is a heavy capital account. Simultaneously, as Mr. Alfred Bevis showed in his remarks at the meeting, the price of gas has been considerably reduced; the dividend has ascended; and the co-partner employees take many thousands a year out of the profits. No one can charge the present Governor and the Board of the Company with not having fully realized their obligations. They have discharged them in a manner

that is notable in the history of joint-stock enterprise in gas supply, and discharged them with every condition weighing against them when they set out on their arduous but super-essential task. All concerned are to-day mutually benefiting from what has been done, and all during the progress of the reforming work have been incrementally benefited. There are "experts" who in Committee rooms animadvert upon the advantage enjoyed by posterity at the expense of present gas consumers. The consumers of a few years ago in North London have not changed so much in constitution that the bulk of them have not derived benefit from what has been done by the financial improvement of the Company. If the rejuvenating work had been left undone, if the old policy had continued, Londoners would by this time have been heavy sufferers from the persistent mismanagement; and the Gas Light and Coke Company—in face of a keen competition—would have been an edifice tottering financially. Administrative obligations in the case of the Company have been fulfilled. And the policy of the last few years is in the keeping of very safe hands.

Value of Good Undivided Funds.

THROUGH the adverse causes applying generally to the gas industry last half year, and not through any want of expansion in the gas business, the Commercial Gas Company were short by £13,949 of the amount of profit needed to pay the statutory dividend—that is to say, profit on the half-year's trading. The number of proprietors at the meeting of the Company last Thursday was smaller than we have seen it for years past—smaller than on any occasion in the previous three years, during which the undivided balance has been in the habit of receiving supplementary contribution, and not being trenched upon. The two facts, as to the shortage in the profit of the six months for dividend purposes, and as to the smallness of the attendance at the meeting, placed in juxtaposition, are eloquent of confidence on the part of the proprietors in the concern, and in those who administer and work for it—from the Chairman (Mr. W. G. Bradshaw) downwards.

The proprietors have good reason for confidence, as also have the stock and share holders in all wisely administered gas undertakings. Even through ill-times, the confidence of investors in the gas industry seems to be less affected than is the case in other industries; and whatever may be the ravages made upon the industry's progress and position indirectly through the present European war, there is a certainty that the old indurated confidence will not be in any way impaired. There is no question that the steadiness of the dividends of gas companies (other than those of not highly reputable birth) is one of the causes for this confidence; and the steadiness largely results from the wise parliamentary provision, concomitant of the sliding-scale, which allows the accumulation of a sufficient amount of undivided profit and reserves to enable the maintenance of financial equilibrium without, in times of temporary adversity, disturbing either the price of gas to the consumers or the dividend to which the proprietors are entitled. With a solid accumulation of undivided profit amounting to £93,518, the proprietors of the Commercial Gas Company looked with perfect equanimity upon a dip into it to the amount of close upon £14,000, seeing that there is still left about £80,000 as well as approximately £40,000 in the reserve. These two sums make a solid bank between current dividend and price and dividend depreciation and a rise in price; and investors realize the safety that there is in this condition. With a gas business progressing, too, as it did last half year, to the amount of 28½ million cubic feet, with coal and oil lower in price, although there are the heavier priced stocks to be first worked off, and with the success the Company are meeting with in developing the industrial use of both gas and coke (the Company's district being essentially an industrial one), there is every reason for confidence. However, the point as to the advantage of a good undivided balance is notable among others in Mr. Bradshaw's address.

In speaking of "good undivided balances," we do not refer to exorbitant ones. Not many years ago it was thought by us as well as others that some companies were prone to hoard up too large balances of undivided profit, to the disadvantage of the consumers. But the years since have brought conviction that a respectable available sum in hand is absolutely necessary. The shocks of a national coal strike, a railway strike, and a European war are experiences that assist to remould opinions as to what constitutes a sufficiency. It is well for gas companies to be prepared nowadays for all emergencies and events, so as to ensure the maintenance of the equilibrium of which Mr. Bradshaw spoke last week. Germany some time ago recognized the value of a War Chest.

Coal Prices.

The average price reductions realized under current coal contracts are being mentioned at meetings of companies as they are held. At the Gas Light Company's meeting, it was stated that coal had been purchased at prices showing an average reduction of rather more than 2s. per ton; at the Commercial Company's meeting, 1s. 8½d. per ton was the figure mentioned; and at the Tottenham meeting, 1s. 8d. per ton. Oil, where high-priced contracts had been previously running, has also been secured on more favourable terms. But there are the stocks of both coal and oil in hand which carry last year's values; so that these stocks in some cases will mean that, in the current half year, the advantage of the lower prices will be reduced by something like one-half.

Automatic System of Operating Public Lamps.

The automatic system of lighting and extinguishing public gas-lamps is showing in the Tottenham district material economy which cannot be ignored. Taking the last twelve months, the costs amounted to 11s. 8d. per lamp, including all labour, materials ("materials" embracing mantles, glass, &c.), depreciation, interest, and amortization; and the figure represents a saving of upwards of 10s. per lamp per annum compared with the hand system. This is a saving which must appeal to lighting authorities. There need be no feeling about the displacement of the practitioners of ancient lighting and extinguishing methods, as, with the expanding business in the gas industry, there is plenty of room for them in other branches of employment. Greater economy in lighting in relation to the illumination provided is something that cannot be neglected.

The German Gasholder Contract.

There was a brief reference by Sir Corbet Woodall, in his address at the meeting of the Tottenham District Light, Heat, and Power Company, to the subject of the contract for a gasholder which the Board had given to an engineering firm of the highest repute in Germany; their tender to the specifications of the Engineer (Mr. A. E. Broadberry) having shown a saving of £3500. The European war has introduced an obstacle to the carrying out of the contract; and there must—it is inevitable—be some delay in executing the work. It may be that the Company with its ever-expanding business cannot wait; and if the delay is to be an indefinite one, it may lead to the cancellation of the order. If it does, then we should not be surprised to hear—it would be only fair in fact—that arrangements had been made for carrying out the work by the firm who sent in the next lowest tender. As our readers are aware, the next lowest tender was one from an English firm. We want all the work possible in this country at the present stage of affairs. But of late years some substantial engineering contracts have gone over to Germany; electric plant buyers having particularly favoured the Continent. Some of these contracts are now likely to find embodiment here.

Synthetic Process of Sulphate of Ammonia Production.

Among other points in his address at the Tottenham meeting, Sir Corbet Woodall referred to the heavy drop in the market price of sulphate of ammonia, and directly asserted that this was largely due to the synthetic process for the production of sulphate of ammonia in Germany. He added the consolatory expression of opinion that it was doubtful if the process would be further extended now that it had brought down the price. Sir Corbet must have overlooked the statement made by Sir William Crookes, at the recent annual meeting of the Society of Chemical Industry, that the Badische Company were enlarging their plant, and that, by the end of 1915, its capacity would be 130,000 tons [*ante*, p. 210]

We learn from Mr. Lawrence Farquhar, of Alloa, the Hon. Secretary and Treasurer of the Scottish Junior Gas Association (Eastern District), that he is sending to the members the "Transactions" for the past session. The pamphlet contains the reports of the meetings and accounts of the visits reprinted from the "JOURNAL." The President was Mr. William Geddes, of Granton, whose portrait is given as a frontispiece.

DEATH OF MR. ROBERT HESKETH JONES.

It is with sincere regret that we record the death last Tuesday, at his residence "The Knoll," Chichester Road, Croydon, of Mr. Robert Hesketh Jones. It may be remembered that Mr. Jones was present on the 21st ult. at the meeting of the European Gas Company, Limited, at which his retirement from the chairmanship was announced. He was, however, one of the retiring Directors; and, on the proposition of the Chairman (Mr. H. E. Jones), seconded by the Deputy-Chairman (Mr. R. S. Gardiner), he was enthusiastically re-elected. In acknowledging the vote, he said he felt that, at his advanced age (he was close upon eighty-seven), it was time for him to relinquish the onerous duties appertaining to the position of Chairman of the Company; and it was only at the earnest request of his colleagues that he had consented to place his name before the shareholders for re-election as a Director. But he assured them that, if spared, no exertion on his part would be wanting to perform the duties which properly belonged to the office of a Director. He expressed his pleasure in accepting the position as a mark of the approbation of the shareholders of his efforts on behalf of the Company in the past. No one who saw him upon the occasion referred to, and listened to his remarks, which were made with perfect fluency, would have thought that he was so soon to be relieved for ever of the duties he had once more undertaken, and had shown himself so desirous of discharging satisfactorily. He will be greatly missed by his colleagues on the Board, as well as by a number of friends both in England and France.

Mr. Jones's connection with the gas industry extended over the long period of sixty-six years; for in 1848 he became Secretary of the Dover Gas Company, the Engineer of which was Mr. John Kirkham. The Company was an early one, having been incorporated in 1822—long before the time when gas companies' accounts had to be kept in a manner prescribed by Parliament; and the first task undertaken by the new Secretary was to examine the financial condition of the undertaking. The result was the discovery of considerable defalcations, which, after some trouble, were set right, and the accounts placed upon a proper footing. In 1856 there came a change in the management; a lease of the property for twenty-one years having been secured by Mr. Jones in conjunction with the late Mr. George Anderson. On the termination of the lease, the works were taken over by the Company; Mr. Jones holding the position of General Manager, and Mr. T. N. Kirkham, the son of the former Engineer, being Consulting Engineer. Mr. Jones remained with the Company till 1885, when he sent in his resignation. The Directors accepted it; and, in taking leave of him, expressed their appreciation of the great efficiency with which he had discharged the duties of his office, and their desire to put on record the kindly feeling which had invariably existed between him and the Board. Mr. Jones and Mr. Anderson were also lessees of the Waterford and other gas-works in Ireland; and early in 1894 he was elected Chairman of the Waterford Company, in succession to Mr. J. H. Sugrue.

After his retirement from Dover, Mr. Jones became interested in a number of gas undertakings. He was one of the first Directors of the Woking Water and Gas Company and of William Sugg and Co., Limited. From these undertakings, however, he retired. He was one of the Auditors of the Brighton and Hove Gas Company; but he relinquished the position in 1894, and was elected a Director to fill a vacancy on the Board caused by the death of Mr. George E. Forrest. In August, 1900, he became a Director of the Bournemouth Gas and Water Company, and held the position till early in the present year, when he resigned his seat for reasons of health. He was also a member of the Board of the Oriental Gas Company, and on the death of the Chairman (Mr. J. Blacket Gill) in November, 1900, he was selected to fill the vacant position, which he held till 1910, when he was succeeded by Mr. H. D. Ellis. He was upon the Board of the European Gas Company, of which Mr. Gill was Chairman. On his death he was succeeded by Mr. N. E. B. Garey, who, however, resigned in favour of Mr. Jones. When Mr. H. M'Lauchlan Backler died in 1892, Mr. Jones was elected a Director of the Continental Union Gas Company in this country and of L'Union des Gaz in France. These positions he relinquished early in 1909.

To the utmost of his ability, Mr. Jones fostered cordial relations between the gas engineers of France and this country. He took part in welcoming the former when they came over, at the time of the first International Gas and Electric Exhibition at the Crystal Palace; and in 1901 he was deputed by his colleagues on the Board of the Brighton and Hove Gas Company to receive, in the absence of Mr. J. Birch Paddon, the party of members of the Société Technique who had made an excursion to England at the close of their meeting at Dieppe, and had accepted an invitation to visit Brighton as guests of the Company. This event will be recollected by all who had the good fortune to be present on the occasion. The party were escorted by Mr. Jones and Mr. J. Cash, the Engineer, to the gas-works at Portslade, which were inspected under the guidance of Mr. Cash and the Assistant-Engineer (Mr. John Paddon, jun.). On the return to Brighton, the visitors were entertained at luncheon in the Royal Pavilion, under the presidency of Mr. Jones. Again, in the year 1905, when the Society met in Havre, he, as Chairman of the European Gas Company, who supply the town, was the presiding host in the lavish entertainments the Company had provided. In this capacity he had associated with him the Deputy-Chairman (Mr. H. E. Jones). At the Society's dinner, M. Gaston Gautier, the Company's Manager at Havre, characterized the treatment the members had received as "large and generous;" and he thanked the administrators of the Company accordingly. Mr. Jones also presided at the open-air luncheon on the delightful excursion to Tancarville, and addressed his guests in French, which he spoke fluently and with good accent. It may be remembered that a few years ago a party of French engineers visited Bournemouth; and Mr. Jones then took part in entertaining them.

Mr. Jones was admitted into the British Association of Gas Managers in 1866, served on the Committee, and was a Vice-President in 1881 and 1882. He was also a subscriber to the Benevolent Fund. He left the Institute in 1898, and did not join the present Institution. Outside the gas industry, several institutions profited by his liberal contributions to their funds. He was an active Churchman; and when only twenty-three years of age he was Churchwarden of St. James's, Dover. He was one of the founders of the St. Barnabas Homes for Aged Clergy, a Vice-President of the Society for the Propagation of the Gospel, and a strong supporter of other Church and philanthropic societies. He was a Vice-President of the Dover and Eastbourne Hospitals, the oldest member of the Dover Bench of Magistrates, a free Baron of the Cinque Ports, and a Liveryman of the City of London.

On Aug. 28, 1849, Mr. Jones married Miss Mary Jane Baker; and five years ago they celebrated their diamond jubilee, which unhappily was saddened by the loss of a grand-daughter on the ill-fated *Waratah*.

The funeral took place at Shirley last Friday afternoon. Among those present were Mr. R. S. Gardiner and Mr. Joseph Cash, of Brighton. As representing the European Gas Company was Mr. W. B. Brady, the Secretary; while Mr. W. Williams, the Managing Director, was prevented, at the last minute, from attending by stress of business in connection with the war.

OBITUARY.

We regret to record that Professor W. H. Bone has suffered a severe bereavement by the death of his wife, which took place at a Leeds nursing home last Saturday, as the result of a serious operation. Mr. and Mrs. Bone, with their family, were spending their holiday in Wharfedale; and it was only last Tuesday that the illness developed which necessitated the taking of prompt measures for its relief. Professor Bone's many friends in the gas industry will, we are sure, unite with us in sympathy with him in the great loss he has sustained.

PERSONAL.

We understand that Mr. Frank Jones, M.Inst.C.E., has been elected to fill the vacancy on the Board of the Brighton and Hove Gas Company, caused by the death of Mr. R. Hesketh Jones.

The difficulty which, owing to a mistake, recently arose in connection with the selection of a Gas Engineer to the Macclesfield Corporation, in succession to Mr. W. Newbigging, was disposed of at a meeting of the Town Council last Wednesday, when, on the recommendation of the Gas Committee, Mr. J. E. Blundell, of Southport, was appointed. He is forty years of age, and has been about half this time in the service of the Gas Committee of the Corporation, with whom he has had varied experience both upon and outside the gas-works.

In the "Journal" a fortnight ago, reference was made to the singular success of Mr. Tom Rudge in the last two examinations in "Gas Engineering" and "Gas Supply" by the City and Guilds of London Institute. Supplementing the particulars then given, it may be mentioned that after Mr. Hubert Pooley left Stafford the successful candidate was for nearly four years under the direct personal supervision of Mr. W. M. Valon, the present Gas Engineer and Manager; and it was during this period that he took up the study of "Gas Manufacture." In addition to facilities given to him to prepare for the examinations, the Corporation paid yearly all the fees for his instruction at Birmingham, as well as defrayed his expenses in going and returning, amounting to upwards of £10 annually. Credit must therefore be given to the Gas Committee for the encouragement and substantial assistance they gave Mr. Rudge; and we are sure similar consideration would be shown in the case of any of their other pupils.

Limits of Inflammability of Methane.—This subject was recently dealt with by M. Leprince-Ringuet in the "Comptes Rendus" of the French Academy of Sciences [No. 158; 1914]. According to an abstract of the communication in the "Journal of the Society of Chemical Industry," an empirical expression is deduced, showing the effects of water content and temperature on the limit of inflammability of methane and air. It is also shown that ordinary atmospheric fluctuations of pressure have little effect. The diameter of the explosion tube has a distinct effect—*e.g.*, in a 5·15 mm. tube the limit was 6·95 per cent., while in an 8·15 mm. tube it was 6·17 per cent. The direction of the explosion (from above or below) may also cause the results to vary considerably—*e.g.*, from above 5·76 to below 5·20 per cent.

THE GAS INDUSTRY AND THE WAR.

At the meetings of gas companies held in London up to the present, the Chairmen have announced that the Boards have arranged to look after wives, children, and other dependents during the absence of the reservists, territorials, and volunteers who have joined the colours.

Holidays on the part of officials are being largely postponed, until such times as they can leave their offices free from anxiety.

A careful watch is being kept round gas-works, especially gas-holders unprotected by being isolated from the spots where men are customarily at work. Strangers are also being kept on the public side of gas-works gates, unless they can give satisfactory reasons for entering them.

Answering an inquiry, Mr. D. Milne Watson, the General Manager of the Gas Light and Coke Company, sends the following information:

The number of this Company's employees who have been called up for active service as reservists in the Army and Navy and as territorials is upwards of 1000. The Directors have given instructions that, in the case of a married man, an allowance shall be made sufficient to make up, with the Government rate of pay, his rate of wages or salary. The case of a man having dependents other than a wife or children will be dealt with at the discretion of the Board.

It is the Directors' intention to keep open, as far as practicable, the berth of every employee of the Company called out on active service.

This Company's employees form a large proportion of the Twelfth (County of London) Battalion, otherwise known as "The Rangers," whose Honorary Colonel is Sir Corbet Woodall, the Governor of the Company, and whose Colonel Commanding is Lieut.-Col. T. Wilton, T.D., the Superintendent of the Company's Tar and Ammonia Products Works at Beckton.

Colonel Sir Corbet Woodall yesterday morning bid *au revoir* to a detachment of his men who are leaving for the front.

A number of the Gas Light and Coke Company's motor lorries and cars, as well as the steam-collier *Fulgens* [a photographic reproduction of which appeared on Feb. 4 last, p. 305], have also been pressed for a period into the country's transport service. The *Fulgens* is now making her last journey to London for the Company prior to entering upon her larger duty.

Replying to an inquiry, Mr. Charles Carpenter, D.Sc., the Chairman of the South Metropolitan Gas Company, wrote as follows on the 7th inst.:

You ask what we are doing with regard to the War? Last Saturday the men of the St. John's Ambulance Brigade (Prince of Wales' Corps), registered for Royal Naval Sick Berth duty, and received instructions to mobilize. The order was responded to by over 80 men; and, the following Sunday morning, they assembled at their headquarters, St. John's Gate, Clerkenwell, where I met and wished them good-bye, and told them that what was done in the case of the Boer War would certainly be repeated in the present instance. You may remember that the employees and the Company joined in raising the funds necessary to provide an allowance for every wife, child, and dependent relative during the absence of the reservists in South Africa. The fund was entirely organized and managed by a Committee of the workmen; and it may be interesting to state that the obligations then undertaken with regard to children have not yet been completed, for there are still some dependents who have not yet reached the age of fifteen years.

A meeting of our Co-Partnership Committee was held on Wednesday last, when the matter of a similar fund was discussed, and it is gratifying to record the fact that, although it was pointed out to them that the cost would be much greater in the present case, by reason of the largely increased number of those liable to be called for duty, yet the answer was that they were prepared to go to an *unlimited* extent to meet the requirements which might be made on the proposed fund.

Under the auspices of the members of this Committee, meetings of the employees were held at the various works; and in every case responses have been made which were unanimous, and in the highest degree gratifying by their enthusiasm.

We estimate that we had in our employ something like 650 men liable for public service, which includes men of the army and navy reserve, ambulance brigade, territorials, and others. What I have been most delighted with has been the unanimous outburst of real patriotism, which shows that the springs of love for the Motherland are welling up from the hearts' depths of the thousands of men in the Company's service.

Two rifle ranges have been put at the disposal of all our employees who desire to acquire a knowledge of, or extend their practice in, rifle shooting.

I feel sure that with the magnificent feeling shown of true patriotism, of which the above is such a small example, we cannot but emerge successfully from the struggle into which we have been so unwillingly drawn.

Mr. Stanley H. Jones, the Engineer and General Manager of the Commerical Gas Company, writes:

In reply to yours of the 5th inst., and the question you put to us as to the Company and its employees at the present crisis, I have to say that the Directors are granting half-pay to the nearest dependents of all who are called up for service, and keeping their posts open.

With regard to the resources of the Company, there are ample stocks of coal and oil to last for at least two months; and it is not anticipated that we shall, in any event, be altogether cut off from supplies.

Between 250 and 300 reservists, territorials, and volunteers have joined the colours from the Brentford Gas-Works.

Pensioners of the same Company are offering to return to work in positions in which they can be useful. One of the pensioners of the Company who has offered to return is 70 years of age. In a letter he remarked: "The Company may be short-handed, if you have men called up. I am too old to fight, but will be glad to help the Company in any way by returning to work in any position." This is a proper spirit.

Upwards of 100 of the Tottenham District Light, Heat, and Power Company's employees have joined the colours. Supplementing military pay, the Company are going to give the men half their ordinary pay, and see that their wives and families do not want during their absence. There was a discussion, at the meeting of the Company last Saturday, on the question of contributing to the Prince of Wales's Relief Fund. [See the report in our "Miscellaneous News," p. 347.]

In order to allay anxiety on the part of those employees of the Croydon Gas Company who are called up for active service, the Directors have given instructions that in the case of a married man an allowance shall be made sufficient to make up, with the Government rate of pay, his rate of wages or salary. The case of a man having dependents other than a wife or children will be dealt with at the discretion of the Board. The allowance will be paid direct to the families or dependents in question. The berth of every employee of the Company called out on active service will, as far as practicable, be kept open for him.

The meeting of the Irish Association of Gas Managers is taking place to-day in Dublin, as originally arranged; and we learn from Mr. George Airth, of Dundalk, the Hon. Secretary and Treasurer, that a good attendance is expected.

Messrs. Blagden, Waugh, and Co., of No. 4, Lloyds Avenue, E.C., send the following timely note: "May we suggest that, under the present exceptional circumstances, the public wherever possible should use gas in preference to electricity for lighting and other purposes? If they will do this, there would be at once an increased output of fuel-oil and benzol (for motor purposes). At this time of the year, the consumption of gas is, as is well known, at its lowest; but if our suggestion were acted upon, the increase immediately would be very great. Fortunately, this country has plenty of coal from which the gas is produced."

Messrs. Fletcher, Russell, and Co., Limited, of Warrington, have had their motor lorry requisitioned by the War Office for transport purposes; but they ask us to state that they are endeavouring to get out orders with all expedition, and will do so as long as carrying facilities are available. They report being exceedingly busy in their grinding department—having received a Government order for sharpening bayonets for the Fourth South Lancashire Regiment.

The General Purposes Committee of the London County Council, in a report to be presented at a special meeting to-day, state that, on behalf of the Council, they have guaranteed half pay to all men now in their service who at the time of mobilization were members of the Reserve or Territorial force, and who have been, or may be, called up on active service, and who are married or have dependent relatives; and they have also guaranteed that all officers and employees, whether married or single, who have been called up shall be reinstated at the conclusion of the war, without loss of seniority or qualification for pension or superannuation allowance.

The Metropolitan Water Board, at their meeting last Tuesday, passed the following resolution: "That any officer or servant of the Board who, as a member of the territorial or other reserve (naval or military) forces of the Crown, may be affected by the mobilization or embodiment consequent on the present European crisis, be allowed leave of absence during his naval or military service; that he be reinstated on his return with no loss of position or emoluments consequent on his enforced absence; that the Board pay him (or such other person or persons as he may appoint) during such period such sums as, with the pay he receives from the Government, will make up his full salary or wages; and, further, that the respective committees be authorized to make such temporary arrangements as may be necessary for carrying on the work of such officers and servants in their absence."

A resolution was, on the proposition of the Lord Mayor (Alderman M'Cabe) unanimously passed by the Manchester City Council at their meeting last Wednesday to the effect that all the reservists and territorials in the service of the Corporation who had been called up should be allowed half-pay during the time they were away. Alderman Holt was the seconder, and he expressed the hope that Manchester's example would be followed by other public bodies and employers.

A resolution has been passed by which the Salford Town

Council declare their intention to provide adequately for the wives and children of employees of the Corporation called away for service in the war. A Special Committee was appointed to prepare a definite scheme.

Many of the Leeds Corporation servants belong to the Army reserve, and have been called up; and last Wednesday the General Purposes Committee held an emergency meeting, at which they decided to recommend that all these men should be reinstated upon their return. Meanwhile, allowances will be made of 5s. per week to each single man with dependents; and 5s. per week to the wife of each married man, with an additional 2s. per week for each child under fifteen years of age.

An intimation having been conveyed to the Dublin Corporation Electricity Works, at the Pigeon House, on the Liffey, that the reserve of steam coal there may be commandeered for Naval purposes, it is expected that gas will have to be resorted to in large measure for lighting purposes. The Gas Company's stock of coal is ample to meet all possible requirements for a considerable period. The supply of carbons for electric street-lamps is under German contract; but there are in stock sufficient to last for three or four weeks.

Engineers and Secretaries of gas undertakings are invited to send information for inclusion in these notes. No particulars can be published except from responsible members of gas administrations or officials, and from our own regular correspondents.

NOTES FROM WESTMINSTER.

PRIVATE BILLS are now rapidly receiving the Royal Assent; and it is a good thing that the formal and contentious work in connection with them was urged forward early, for otherwise in the present international crisis, and the interruption of normal work for other of a more pressing nature, proceedings would undoubtedly have suffered. The last two or three weeks, there has been little to engage attention in the Committee rooms; but those who have been called there by the small amount that has been doing have, in the corridors, found their chief conversation wandering to the one topic that is occupying men's minds, and ending up with speculation as to whether, as the result of the negotiations between the Prime Minister and the Leader of the Opposition, there will be a prorogation of Parliament or merely an adjournment. However, before the one event or the other takes place, there will be a complete conversion of Private Bills into Acts by the ultimate formality. The final proceedings in the Committee rooms have, as usual when only remnant business is under consideration, been thin and occasional. But two or three points are worth special mention.

The L.G.B. and Calorific Power.

It was unfair of the Local Government Board to, through Mr. Rhodes, appear before a Committee on local authorities measures, and represent that the figures applied in the case of the calorific power clauses of the Gas Light and Coke Company are to be considered as normal ones, for general imposition. As we understand the matter, the conditions surrounding the standard and test have been determined, and not the actual standard figures, which are alterable to suit local conditions. But when the Purchase Bill of the Porthcawl District Council was before the Local Legislation Committee [see the report in "Parliamentary Intelligence" last week, p. 294], Mr. Rhodes argued that the calorific power clauses had been considered to some extent as a whole this session, and several points had been determined. One was as to the "normal" standard which was "fixed" at 540 B.Th.U. If Mr. Rhodes will carry his memory back to what happened at the time, he will recollect that the Board of Trade in their report contended that, owing to the variation of local circumstances, which largely affect the economic side of the question, the actual standard figure should be determined in each case. The Committee who settled the Gas Light and Coke Company's conditions and figures, in the very next case—Liverpool—made changes to fit the unusual circumstances of the city. So how Mr. Rhodes can come along and try to fit the standard applied to the Gas Light and Coke Company to the small Welsh concern, and speak of these conditions as though they were fixed and imperative, it is difficult to see. As a matter of fact, the Porthcawl authority were not asking for anything less than 540 B.Th.U. as a standard; but, in view of the character of the coal they use, they were requesting that, in place of the 7½ per cent. Gas Light margin before penalties begin to operate, they should be allowed the old neutral ground between 540 and 475 B.Th.U. Mr. Rhodes contended for the 7½ per cent., which would have made the penal line only 499½ B.Th.U. The Committee agreed to allow the District Council the greater latitude—*i.e.*, down to 475 B.Th.U. We are pleased to see this, although there would have been no objection to the 7½ per cent., if the standard itself had been lowered to (say) 510 B.Th.U. The 7½ per cent. margin is all right, so long as the standard is at the proper figure. The Committee were informed by Mr. Arthur Lees, the Parliamentary Agent, that the District Council have adopted the single day's test, and the average of two tests, instead of the average of three days' tests, and had also stiffened the penalties, in accordance with the Bedwas and Machen District Council Bill.

Charges for Special Meter Readings.

A novel clause has been allowed by both Houses in the Isle of Thanet (Margate) Gas Bill. At a popular seaside resort like Margate, furnished houses and apartments are let, and frequently special readings of the meters are required—that is to say, readings out of the regular meter-reading time. The Margate Company are put to some expense in this matter; and therefore they have asked Parliament for, and Parliament has agreed to confer, power to make a special charge for these special readings. The charge per special reading is not to exceed 6d. The actual text of the clause appeared in the "Parliamentary Intelligence" last week.

Future General Legislation.

In the Bill of the same Company, there appears the following new precautionary clause: "Nothing in this Act shall exempt the Company or their undertaking from the provisions of any General Act relating to the supply of gas which may be passed in this or any future session of Parliament."

Cost of Shifting Pipes in Main Roads.

Mr. Forbes Lankester, K.C., was the other day looking about for a precedent when before the House of Commons Committee presided over by Mr. Lane-Fox. He failed to find that for which he sought; but in future he will not labour under the same difficulty, as the Committee were influenced by him to create a precedent on the lines he desired. It was in connection with the Weston-super-Mare District Council Water Bill; and the County Council of Somerset asked that, in connection with bridges and their approaches, and the main roads, when alterations or improvements necessitated the moving of the water-pipes, the District Council should bear the cost of the work. Mr. Lankester, for the County Council, argued that the pipes were in the public roads for the District Council's own interest and profit; and, therefore, the County Council ought not, in carrying out their obligations to the public, to be put to expense that they would not have to meet if the pipes of the District Council were not there. The additional expense involved by the pipes, he maintained, should be borne by the District Council. Mr. Lankester argued as though the County Council were alone engaged in a public service, and that the District Council only carried the pipes along the main roads to serve their own interests and for their own profit. As a matter of fact, they are just as much engaged in a public service by distributing water as the County Council are in looking after the maintenance of the roads. Moreover, the position occupied by the pipes was agreed to, in the first instance, by the County Council, and the position satisfies the District Council. The change in the character of road traffic will, of course, necessitate considerable road improvements; but the suppliers of water, with pipes beneath the surface of the roads, do not, through their occupancy of the subsoil, in any way contribute to the necessity for the improvement. The improvement being a public necessity, produced largely by a road-using section of the public, the whole cost should be borne by the public. This seems to us the rational view to take. But Mr. Lankester argues that his is the logical way of looking at the matter. Perhaps so—so long as he was before the Committee on behalf of the Somerset County Council. Parliament must have always entertained the view that we take, seeing that Mr. Lankester failed to find a precedent to support him. Mr. Lane-Fox's Committee, however, set aside the rational view that Parliament has hitherto taken, and followed Mr. Lankester's bidding in the matter—thus imposing a new condition for which there is no justification.

Coal Smoke Abatement Committee.—It is announced that further sittings of the Coal Smoke Abatement Committee have been adjourned *sine die*.

Coke for Wood in Indian Homes.—The report on the working of the Coal Department of the Indian State Railways for the calendar year 1913, by Mr. R. W. Church, Mining Engineer and Metallurgist to the Railway Board, has lately been issued. As regards the important question of providing soft coke as a substitute for wood for domestic use in Indian homes, Mr. Church points out that various methods of low-temperature distillation of coal have been patented of late, which are a great advance upon the wasteful system of burning hitherto in use in Indian collieries; and if some of the better qualities of Indian coal were dealt with in this manner, he says there is no doubt that the resulting fuel would suit Indian methods of cooking, for which a smoky fuel is useless, and the bye-products would in all probability command a good market.

MORE THOUGHTS FROM MUNICH.

In the last number of the "JOURNAL" (p. 277) we gave a critical review, by the engineer and manager of a large gas-works in France, of the exhibition of gas apparatus now open in Munich. When sending his communication, he promised to deal, in a future issue, with the building and some of its contents. This he has now done; and the following is the first instalment of his remarks.

THE GENERAL LIGHTING OF THE EXHIBITION.

The exterior lighting of the exhibition is done very satisfactorily by 12 Graetzin high-pressure lamps, each of 4000-candle power, and 24 of 3000-candle power, placed in groups of four, mounted on elegant square pillars constructed of reinforced concrete. This lighting is strengthened by lines and devices in fire which run the length of the palaces, as well as by immense flares of gas issuing from tripods of a very decorative character. They are shown in the illustrations given on p. 277 last week. The interior lighting is carried out by means of lamps and burners of all systems. The illumination of the principal hall is particularly brilliant, there being employed for the purpose 16 Graetzin lamps of 4000-candle and 20 of 1500-candle power.

For the whole of their high-power lighting, the firm of Ehrich and Graetz have installed two compressors, each of a capacity of 120 cubic metres (about 4250 cubic feet) per hour, driven at the rate of 750 revolutions per minute by two "Fafnir" gas-engines of 3 H.P. The supply of all the lamps attached to pillars or suspended in the galleries is effected by means of flexible metallic tubing, which greatly simplifies their equipment, and enables them to be manipulated by the aid of an ordinary hand-winch.

STATISTICS OF GERMAN GAS-WORKS.

It was in the year 1826 that the Imperial Continental Gas Association built the first gas-works in Berlin and Hanover. The first gas-works constructed by Germans were those in Dresden and Frankfort, in 1828. Then came the following: Liepzig, in 1838; Cologne, in 1840; Baden, Barmen, Stuttgart, and Frankfort-on-the-Main (by the Imperial Continental Gas Association), in 1845; the two municipal gas-works in Berlin, and those at Nuremberg, Breslau, and Coblenz, in 1847; and the works at Cassel, Munich, and Freiberg in 1850. Sixty years after the introduction of gas the number of works was only 266; but it then began to increase, though slowly—there being 869 in 1899. From this last date, however, there was an extremely rapid advance; the number almost doubling in ten years. It was 1647 in 1908; and 1700 at the close of 1913.

The production of gas was about on similar lines. In 1859 it was 44½ million cubic metres (1560 million cubic feet); in 1862 it was 68½ millions (2418 million cubic feet); in 1896 it had reached 733 millions (25,886 million cubic feet); in 1900 the figure was 1200 millions (42,300 million cubic feet); in 1912 it was 2732 millions (96,440 million cubic feet); and last year it exceeded 2900 millions (102,400 million cubic feet). The period of development began in 1900; and the annual increases ranged from 116 to 131 million cubic metres, or from 4100 to 4700 million cubic feet.

At the entrance to the principal hall of the exhibition, Herr Dr. F. Greineder, of Cologne, shows in a very attractive way the technical and financial results of the working of German gas undertakings in the year 1912-13. Cubes and a small gas-holder represent, on a certain scale, either in cubic metres or in metric tons, the quantities of coal carbonized and of residuals produced, or in marks the amount of the capital employed in carrying on all the undertakings. Dr. Greineder has published a book in connection with the exhibition,* and from it have been taken the figures contained in the two following tables. In the larger one, no account has been taken of the value of the spent purifying material, which is upwards of 46,000 marks; while in the smaller table the cost of labour (78,600,000 marks) and working expenses (58,700,000 marks) appear to have been left out of consideration.

Financial Results of the Working of German Gas Undertakings in 1912-13.

	Marks.	Pfgs. per Cubic Metre.
Capital expenditure	1,521,900,000	—
Book value of capital	916,600,000	—
Net cost of gas	167,874,000	6·47
Interest	37,802,000	1·45
Sinking fund	45,657,000	1·76
Gross cost of gas	251,333,000	9·68
Receipts	384,580,000	14·81
Net profit	133,247,000	5·13

	Ratio of Dividend to Capital Expenditure.	Ratio of Dividend to Book Value of Capital.
Revenue or net dividend	8·76 p. ct.	14·54 p. ct.
Dividend, interest, and sinking fund	11·24 ,,	18·66 ,,
Gross dividend	14·24 ,,	23·64 ,,

A large number of statistical documents are spread about the exhibition; each town having been desirous of giving particulars to show the growth of the gas-works. The most interesting are supplied by the Wirtschaftliche Vereinigung Deutscher Gaswerk Actien Gesellschaft of Cologne. This is a kind of Syndicate for the sale of residual products; and, under sometimes very ingenious forms, they furnish many details relative to the working of gas undertakings in 1912. They show that the output of gas, in cubic metres [1 c.m. = 35·3 cubic feet], per head per annum was as follows: Charlottenburg, 186; Berlin, 177; Bremen, 150; Carlsruhe, 120; Munich, 69. The average consumption per consumer, in cubic metres, was: Cologne, 973; Charlottenburg, 733; Berlin, 645; Munich, 460. The length of mains, in kilometres [1 km. = 0·6 mile], was: Berlin, 1790; Hamburg, 849; Leipzig, 698; Düsseldorf, 660. All the gas-mains in Germany would, if placed end to end, more than encircle the globe. The total gas-holder capacity is 2733 million cubic metres, or about 96,475 million cubic feet. In the following table are epitomized some particulars per kilometre of mains given by Dr. Greineder:

Town.	Gas Sold. Cubic Metres.	Number of Inhabitants.	Number of Consumers.
Berlin	169,142	1123	227
Charlottenburg	191,166	1027	230
Cologne	100,766	1019	85
Munich	88,943	1293	169

Prepayment meters, which at Königsberg are more numerous than those of the ordinary type, are scarcely employed at Stuttgart and Cologne.

In order to show the importance of the gas industry, the Cologne Syndicate already named has represented by a mass of coal weighing 14·68 tons the carbonization in one minute of all the gas-works in Germany, and by a heap of coke weighing 10·43 tons the production of this residual in a similar time. A very fine genealogical tree shows all the products derived from coal and extracted from tar; and samples of all kinds, photographs, &c., complete this interesting exhibit.

PROPAGANDA WORK.

The Cologne Syndicate possesses technical offices in that city and an experimental laboratory in Berlin. They publish various pamphlets, one of which gives very concise practical advice on the management of coke-fires for domestic purposes; and they also organize courses in industrial heating. They appear to be very prosperous, as the revenue from the sale of coke rose from 4,640,000 marks (£232,000) in 1909 to 10,357,000 marks (£517,850) in 1912.

Side by side with the organization just referred to may be placed the Zentrale für Gasverwertung of Berlin—an Association formed in 1911 for propaganda work—who, by their intelligent

* "Die Wirtschaft der Deutschen Gaswerke," noticed in the "JOURNAL" last week (p. 282).

Production of German Gas-Works in 1912-13.

[Coal carbonized, 8,500,000 tons; value, 161,500,000 marks.]

	Quantities Produced. Total.	Quantities Produced. Percentage of the Weight of Coal Used.	Value of the Products. Total Marks.	Value of the Products. Per Cent. of Cost of Coal.	Value of the Products. Per Cent. of Total Receipts.	
Gas produced cub. met.	2,733,000,000	..	..	..	..	
Do. sold ,,	2,596,350,000	..	384,600,000	238·1	76·5	
Do. do. tons	1,487,500	17·50	..	..	..	
Coke produced ,,	5,525,000	65·00	..	..	..	
Do. sold ,,	(4,760,000)	..	88,060,000	54·5	17·5	
Tar ,,	425,000	5·00	12,750,000	7·9	2·5	
Ammoniacal liquor ,,	1,055,400	12·42	..	..	..	
Do., as ammonia ,,	(19,000)	..	..	..	..	
Do., as sulphate ,,	(76,000)	..	16,150,000	10·0	3·2	23·5
Cyanogen ,,	1,800	0·02	..	..	..	
Do., as Berlin blue ,,	(3,250)	..	1,300,000	0·8	0·24	
Graphite ,,	5,300	0·06	300,000	0·2	0·06	
Totals	8,500,000	100·00	503,160,000	311·5	100·0	

activity, have already rendered great service to the gas industry in Germany. At their very elegantly fitted-up stand they show numerous leaflets, pamphlets of all kinds, post-cards, posters, lantern slides, and cinematograph films—all intended for advertisement purposes.

In addition to the *Z*entrale, the Society "Licht und Wärme" publish interesting pamphlets dealing with culinary operations, the use of prepayment meters, &c., as well as a kind of *agenda* in which each page contains some useful particulars in regard to the general management of gas appliances.

ELECTRICITY SUPPLY MEMORANDA.

THE little passage that we have recently had with Mr. A. H. Dykes regarding a published report of remarks that he had made on the subject of fixed-price electric-lighting installations in small houses [see the "Correspondence" columns last "JOURNAL," p. 290"] brought out, among others, three points. One was that, in the houses of the working class where even the fixed-price system obtains a footing, only a very small revenue per annum is possible for an uncontrolled use of the lamps; secondly, that the installation does not displace the prepayment gas-meter, as it is required for other purposes; and, thirdly, from a substantial investigation that has been made, it is found that the gas revenue from such houses is reduced very little as a result of the introduction of a few electric lamps—proving the former small cost (especially where incandescent gas-burners were used) of gas lighting to the tenants of the houses. Previous to that, an investigation made by the writer of these notes, in some small houses where assisted or free-wiring had been introduced by a certain council, indicated a considerable depreciation of the installations, and a reduced use of the lights, with a gradual re-establishing of gas, accompanied by the more useful and less eye-impairing inverted gas-lights [see "JOURNAL" for May 12 last, p. 407]. Such free-wiring installations were lightly entered upon at one time; but experience shows that it is only necessary to wait a period to learn of the disillusionment of the electrical men who indulge in these commercial escapades. The tenants of the houses are anything but stable ones, and their successors cannot be relied upon to become patrons of the electric light. As depreciation of installation goes on—and it proceeds at a faster rate in these houses than in others where more care is exercised, and faster because the installation itself is of an inferior order—expenses increase; and the calls on the electricity department (which calls dare not be neglected) to repair slight defects become more and more frequent and costly. The consumption, too, being small, capital expenditure (including maintenance) does not receive any adequate return, let alone liquidation. This is the general experience; and, as soon as there is realization of it (if only the electrical engineer has the courage to acknowledge his mistake), there is a positive end to further craving for the custom of the small consumer, whose demand for current is coincident with that of far more profitable lighting consumers.

Free-Wired Installations.

Cutting their Losses.

A fresh illustration of eye-opening in this matter is supplied by the Electricity Committee of the Heston and Isleworth District Council. Their experiences have been anything but favourable or profitable. Nine years ago the Council expended £2340 in installing wires and fittings in houses of small consumers. They did this no doubt on "expert" advice, and with the greatest confidence in a golden issue. The issue is before us. There is still a sum of £1568 outstanding (notwithstanding that £105 has already been written off as irrecoverable) in respect of these installations. Only in a few cases did the tenants of the free-wired houses agree to pay for the cost on the instalment system; the major part deciding to pay an extra ¾d. per unit for current. As far back as December, 1911, when the price of current to the ordinary consumers was reduced from 5d. to 4d. per unit, it was resolved that the tenants of the free-wired houses should pay 5d., including the "extra" for the installation. Still there is the outstanding £1568, which shows that the ¾d. until December, 1911, and the 1d. since, have not done much towards liquidating the debt—indicating how small has been the consumption by the people whom the free-wiring policy was intended to serve. At the rate at which depreciation is going on, there would, under the circumstances, be no possible chance of clearing off the debt during the life-time of the subject. The Council have, therefore, done the wise thing. They have decided to cut their losses by writing-off the outstanding debt, and virtually abandon the free-wired installations—placing on the books as ordinary consumers the tenants of the houses in which the installations exist, and charging them (as in other cases) 4d. per unit. The responsibility of repair and maintenance will then be the tenants'; and in such houses, it is pretty clear (we know it from experience) what will almost generally happen. The Electrical Engineer has made a report which shows that, apart from the heavy outstanding capital sum, this class of small consumer causes a good deal of incidental worry and expense to the department. In the course of the last three years, he says, no less than 700 visits have been paid to free-wired houses in response to complaints, which, though mostly trivial, involve the expenditure of considerable time and trouble, which he estimates cost at least £100 per annum. He finds a want of care, on the part of these consumers, over the installations. The frequent change in tenancy also complicates the position. Upon this, the "Electrical Times" remarks that "as, after nine years, the cost of maintenance must tend materially to increase, the Council is no doubt well advised to cut its losses, and decline to accept further responsibility for the installations." We remember when the "Electrical Times" was urging cheap wiring and cheap installations for workmen's homes. Experience of the conditions in these homes, and of what actually happens to electrical installations, has assisted to a modification of views. As exposed wires are apt to get their insulation damaged, and, as the Electrical Press has had it brought home to them that death can be caused by shock at ordinary voltages, this too may possibly have had something to do with the quieting-down of the advocacy for cheaper forms of wiring.

The Unconscientious Model.

Gas men could (if it were not bad manners to do so) afford to sneer in a most pronounced manner at some of the "model" advertisements which the "Electrical Times" publishes for use by electricity supply undertakings. One of the latest efforts has been in the shape of extracts from the factory inspectors' reports, included in the annual report of the Chief Inspector of Factories and Workshops (*ante*, pp. 81, 89, 215). The selection for the model advertisement has been a very careful one, and resolves itself principally into references to the supposed "eye strain" resulting from the use of low intrinsic brilliancy flat-flame gas-lights. How electrical engineers who know anything of the relative intrinsic brilliancy of a luminous gas-flame and of the metallic filament of an electric-lamp, must laugh over the suggestion that they should make fools of themselves by adopting this meanly crafty form of advertising. It is noticed that the draft advertisement does not include these lines from the report of Miss Anderson:

> One difficulty is that of procuring any shade for the big metal filament electric-lamps now so largely used. The glare of these in the eyes of the machine operatives in all classes of factories is a troublesome accompaniment of the work; and one finds much makeshift screening by workers where such individual effort is permitted.

Nor these from the report of Miss Meiklejohn:

> One large firm has adopted indirect [electric] lighting. *They say* that the result is good—the light more nearly resembling natural light. I believe, however, it is more expensive, and a stronger light is required.

Nor is anything said as to how proper ventilation in certain electric-lamp factories, where numerous gas-jet machines are in use, causes the atmosphere to show a remarkably low percentage of carbon dioxide. Nor is anything said as to the proof afforded of the ventilating capacity of the products of gas combustion, with very simple means of outlet. Nor is any reference made in the draft advertisement to the electrical accidents in factories, and to the fatalities that occur in works through electrical shock. This statement by Mr. G. Scott Ram, the Chief Electrical Inspector, is also omitted:

> Although the total number of electrical accidents in works does not average more than one in perhaps a hundred works, "the conditions conducive to accident are present in a very much larger proportion, and, in many works visited, it appears to have been purely a matter of good fortune that accidents have not occurred."

Nor in the draft copy is mention made of Mr. Scott Ram's reference to the "cheap and flimsy" character of much of the electrical apparatus on the market; and this statement is not quoted:

> Considerable trouble is often experienced with the flexible conductors for electric irons; short-circuits occurring at the point where they are led away from the iron, due to the constant bending of the wire and insulation, and to the heat from the iron.

There is omission, too, from the draft advertisement copy of all reference to the fatalities at voltages of 200 to 250. And the "Electrical Times" merely suggests the use for advertisement purposes of the extracts as to "eye-strain," due to flat-flame gas-burners! Well, well! There is splendid innocence here; or is it that some people's ideals in the matter of commercial morality cannot get beyond the gutter?

The Electrical Reporting Mode.

In connection with the foregoing, it may also be pointed out that there appears to be a studied attempt on the part of certain of our electrical contemporaries, through reports in their columns, to mislead their readers. Criticism has been made of this breach of journalistic uprightness on previous occasions; and now the "Electrical Review" has opened itself to censure by publishing a very childish piece of misrepresentation. Here it is:

> **Burton.**—A GAS LOAN.—At a recent L.G.B inquiry as to an application to borrow £25,000 for the gas undertaking, the Inspector pointed out the growing competition of electricity, and said he did not see his way to recommend the granting of more than £7000 for immediate requirements.

Only one construction can be placed on this paragraph as pre-

sented to the readers of the "Review." It is that, owing to the growing competition of electricity, the Inspector could not see his way to recommend the granting of more than £7000 for immediate requirements. What actually happened is this: The Corporation desired a repayment period of thirty years; and the Inspector (Mr. H. R. Hooper) asked whether twenty years would not be long enough, whereupon the Town Clerk pointed to the grant by the Board only last year of thirty years for extensions. Then came the remark by the Inspector that "electricity was fast becoming a strong competitor; and, to an extent, the future of gas would be governed by the progress made by the former." Succeeding was given the reason for reducing to £7000 the amount applied for. "In view of the fact," said the Inspector, "that the total sum applied for was for work which would extend over several years, he did not see his way to recommend the granting of more than the £7000 required for immediate necessities. When it became necessary to complete the scheme—say, *in about eighteen months or two years' time*—the Council could forward an application for the balance of the loan. *He did not know that a second inquiry would be necessary.*" This is altogether a different story from the one that the "Electrical Review" was pleased to serve up to its readers, and evidently wished them to believe. It is a regrettable thing to see a paper of the standing of the "Review" indulging in such petty methods. We hope, for its own credit, that it has been the victim of a local correspondent who misinterpreted the requirements of high-class and honest journalism. If this is the explanation, then the incident shows the necessity for more rigorous care being exercised in the editorial office of the "Review," and for the suppression of the evident excess of credulousness that exists therein.

The Future.

Regarding the remark of Mr. Hooper that electricity is fast becoming a strong competitor, and, to an extent, the future of gas would be governed by the progress made by the former, these are commonplace observations which no one would seriously dispute. Years before they were uttered by Mr. Hooper, the gas industry seriously accepted electricity as "a strong competitor;" and during all these years the gas industry, as Mr. Hooper can see from the Board of Trade returns, has rejoiced in an expansion of business. It will be remarked that Mr. Hooper qualified, by the words "to an extent," what he had to say as to the future of gas. Of course, its future will "to an extent" be governed by the progress made by electricity. But we are rather inclined to think, from the close observation kept by us upon the gas industry, that the future of gas will be more largely governed by the extent of its developments in directions where there is little, or only limited, room for the application of electricity; and that the economies produced by the utilization of up-to-date gas-manufacturing plant and the cheapening of gas will have a very considerable influence upon the rate of the further development of the industry.

A Shortage in the Purse.

An experience at Carlisle shows how easily a profit on electrical supply can slip over to a deficiency, which indicates (where it happens) a too narrow margin of charge to cover contingencies. Mr. F. W. Purse is one of the little band of men who, like the half-watt lamp, disguise themselves in a description to which they have no real title. The majority of the "Point-Fives" do not supply at 0·5d. per unit. The 0·5d. is generally supplemented by something else. However, the year before last Mr. Purse boasted of a profit for his department of £1510; in the past financial year there was a deficiency of £209. Coal increased in cost by £1426. Seeing that the consumption of units advanced from 2,531,545 to 3,140,457, there does not appear to be any reason for a deficiency other than the charges involved by an increase in capital expenditure. Even so, it cannot be claimed that the charges made by the department were sufficient to allow its finances to meet its obligations. Will Mr. Purse tell us how much more the deficiency would have been had he not been a Point-Five?

The L.C.C. Scheme.

The electrical papers, in bringing before their readers the provisional scheme of the Special Committee of the London County Council for the future electricity supply of London [which scheme was discussed in our leader columns last week, and outlined the week before] do not do much more than refer to the proposals, without subjecting them to comment. There is one thing in particular that they do not do, and that is consider, in the light of the Committee's financial suggestions, how the municipal-company-expert-committee organization—a composite body which foreshadows the presence of too-many cooks—is going to cheapen the cost of electricity supply to London. Straightway, however, our contemporaries accept the scheme, without honouring it by any depth of consideration. The "Electrical Review" says the scheme is novel so far as this country is concerned; and it represents a serious effort to bring together the various conflicting interests. It evidently likes the idea of mutual co-operation between municipal and private capital. The "Electrician" regards the scheme as a great advance on any action the London County Council have taken in regard to London electricity supply during recent years. But there are points that are not altogether satisfactory. It does not like the idea of the scheme passing, at the end of half a century (!) under municipal-company control, because it would be less efficient. The "Electrical Times" thinks the situation offers great opportunities to the present companies if only they can adjust their internal differences. But it wonders what the Progressive minority of the Council will do seeing that the scheme involves the element of private enterprise. "Electrical Industries" is of opinion that the scheme does guarantee to the public a reasonable chance of enjoying the benefits of free development in electricity supply. In what way? We advise a study of the financial aspects so far as they have been exposed.

A MONUMENTAL TREATISE ON GAS.*

M. Masse's new treatise is the most important work on gas which has appeared since "King's Treatise on Coal Gas" left the press. Like the latter, it is in three volumes; but as a consequence of the development and ramifications in recent years of the gas industry, its scope is much wider, and there is a great deal more matter compressed within the same compass. This observation applies more particularly to the text; for M. Masse has thought it unnecessary to give plates similar to those which were a characteristic feature of King's Treatise. It is true that he provides nearly 800 illustrations, the majority of which are well chosen and well adapted to serve their purpose. But they make no pretence to artistic merit, and in some cases—as, for instance, some reproductions of the Ackermann plates in one of Accum's treatises—the execution leaves very much to be desired. These blemishes, however, do not seriously affect the practical utility of M. Masse's work to the gas man and student.

The first volume is the smaller of the three, and is largely merely introductory. It contains 98 pages of tables of contents. The first of these tables shows the methodical arrangement of the whole work, which comprises eight parts—viz.: (1) Historical, (2) Provision of Coal, (3) Distillation of Coal, (4) Special Processes of Gas Manufacture, (5) Treatment of the Gas, (6) Auxiliaries of Gas Manufacture, (7) Grouping and Relation of the Various Services of a Gas-Works, (8) Distribution of Gas under High Pressure to a Distance.

Each part is subdivided into a number of chapters, the headings of most of which will be quoted later. It may be said here, however, that the scheme of the work is exhaustive, and the arrangement of the matter is logical and convenient. The table of contents which presents the order of arrangement of the volumes is followed by an alphabetical table or general index of subjects, and after this is a special index of the gas-works which the author has selected as having installations or plant deserving special mention and illustration. A glance at this index discloses the cosmopolitan spirit with which M. Masse has handled his subject; for, the illustrations of plant, &c., are taken quite as freely from English and German as from French gas-works. American, Austrian, Belgian, Danish, Dutch, Italian, and Swiss works have also provided many views of installations, &c., which he has regarded as specially deserving of notice.

The tables of contents are followed by a short introduction, and then the text of the work opens with the first or historical part. After an interesting review of modes of lighting, heating, and obtaining motive power, which were available before the advent of gas, the discovery of illuminating gas and its application to the public service are dealt with. The author quotes the early observations on the production of tar and an inflammable vapour from coal, and then refers to the work of Lebon and Murdoch. We may perhaps think that he is inclined to favour Lebon's claims to priority; but it would be wrong to say that his treatment of the matter is not that of an impartial historian who has availed himself of all the records at his disposal. It is interesting to have the photographic reproductions of the notices, in his own handwriting, which Lebon lodged in 1799 and 1801, in support of his applications for French patents.

The author deals rather scathingly with Winsor's efforts at exploiting gas, and curiously enough gives Winsor as co-author with Accum of the "Practical Treatise on Gas Lighting," published in 1816, from which a number of illustrations are reproduced. The book in question is probably a French translation of Accum's work, which was first published in 1815; and we do not understand how M. Masse has come to associate Winsor with the authorship of it, unless perhaps Winsor was responsible for the translation into French. The reproductions of the five Ackermann plates are not creditable to the photographer and process worker. M. Masse says rightly that in England in 1820 the clergy opposed the introduction of gas into churches; but a curious statement in a foot-note, to the effect that the imposing dining halls at Oxford and Cambridge are to this day lighted only by candles, is hardly correct. The last chapter of the historical part of the book deals with features of the gas industry; and the consumption of gas per head of the population in nine large towns of England, Holland, and Germany is given, together with the average price charged for gas. The author demonstrates conclusively that increased consumption followed a reduction in the price of gas.

The first volume of M. Masse's work contains only two of the eight parts into which the text is divided. The first or historical

* "Le Gaz" par René Masse, Ancien Élève de l'École polytechnique, Ingénieur Civil des Mines. Paris et Liége, Librarie polytechnique, Ch. Béranger. 1914.

part, already referred to, is naturally not very long; but the second part, relating to the "Provision of Coal," is long, and is one of the most important. It is divided into five chapters. The first of these chapters handles the sources of coal. The French supplies from five basins or districts are described—the names of the chief mines and the outputs in recent years of gas and other coal being given. Then follows a section on the coal of Great Britain, which is classified as coming from five principal districts —viz., from Scotland, Durham, Yorkshire, Lancashire, and South Wales. The chief mines in these districts from which gas coal is obtained are mentioned, with the extent to which the coal is exported or retained for home consumption. Belgian coal is next dealt with, and then German, which is ranged under four districts. Then follows an exceptionally full account of the sources of coal on the North-American continent, and an interesting discussion of the conditions of coal supply there and in the chief European countries in relation to the question of the importation of American coal into Europe. There are many diagrams of the relative cost, output, &c., in the different countries.

In the next chapter, the composition and classification of coal are considered. Here again it is gratifying to find that M. Masse has not confined his treatment to the coals which are used in the majority of French gas-works, but has included in it the best-known gas coals of nearly all countries. There is a valuable little table which gives the equivalent classifications of coals in France, Germany, Belgium, England, and the United States. The selection of coal for gas manufacture is discussed, with the modes and results of testing. A very full treatment is accorded in the subsequent chapters of this part to the transport and unloading of coal, and its storage on the works. Views are given of typical plant from many of the chief works both here and abroad; and we can cordially commend to our readers a careful study of this portion of M. Masse's work.

In a subsequent number of the "JOURNAL" we shall refer to the contents of the second and third volumes, in which the manufacture proper, and the distribution and applications of gas are dealt with.

ORGANIZING AND MANAGING GAS-WORKS.*

THE volume on the "Organization and Administration of Gas-Works" which is now before us is the first instalment of a revised edition of Schilling's "Handbook of Gas Lighting," which is well known as the classic German work on gas manufacture and lighting. Since the year 1879, when the third edition of the work left the pen of Dr. N. H. Schilling, no equally comprehensive treatise on the subject has appeared in Germany; and the enormous development in gas engineering which has taken place in the meantime has made it all but impossible for any author to prepare single-handed such a work at the present time. In the forthcoming revision of Schilling's "Handbook," Dr. E. Schilling has Professor H. Bunte as co-editor, and has the assistance of many *collaborateurs*. The revised work will be issued in ten parts, each comprising a distinct branch of the subject; and, curiously enough, it has proved convenient, and seemed opportune, that the tenth part should be the first to appear. This tenth part deals with the highly topical questions of the organization and administration of gas-works, rates of charge for gas, rebates, and propaganda. It is divided into five sections, each by a different author.

The first section is by Herr J. Engländer, of Cologne, and treats of "Private Gas Undertakings." About one-fifth of the gas sold in Germany is made in gas-works not owned by public authorities, though in only five towns of more than 100,000 inhabitants is gas supplied from works owned by companies. Of these the Imperial Continental Gas Association supply in Hanover and Berlin, and are largely interested in the Frankfort Gas Company; the Union des Gaz, of Paris, supplies in Strasbourg; and Dortmund is the only one of the five cities which is served by a purely German gas company. There are, however, a number of German companies, of which the German Continental Gas Company, with headquarters at Dessau, is the most important, each of which operates in a large number of smaller German towns, and some also in Russian and Austrian towns.

The conditions of the concessions or contracts under which companies undertake the supply of gas in Germany are discussed in general terms. A prescribed illuminating power of gas is no longer considered necessary in such contracts. Model clauses for a gas concession are given by the author, who then proceeds to consider the alternative adopted by some local authorities, of leasing their gas-works for a term to some private undertaking. Finally reference is made to a scheme brought forward by Dr. Freund in 1911 for combining the interests of the local authority and a private undertaking, according to which capital is raised by the former body, which in return is represented on the board of the company by which the business of gas supply is actually undertaken. It does not appear that this scheme has yet been adopted anywhere in Germany.

The second section of the book is written by Dr. Fr. Greineder, of Cologne, and relates to "Public Management of Gas-Works." As already indicated, four-fifths of the gas sold in Germany is supplied from works owned and directly managed by local authorities; and hence this section is, from the German standpoint, one of the most important in the volume. Though local authorities do not hold a similar predominating position as gas suppliers in this country, and though the methods of financing, administering, and operating gas-works are considerably different in Germany and Great Britain, there is much in this section that will repay perusal by those directly interested in the supply of gas by local authorities here.

The third section, which is on "Works Management," has been entrusted to Herr Kobbert, the Manager of the Königsberg Corporation Gas-Works. He treats the subject under four headings: (1) "Management and Supervision of Working," (2) "Works' Books, Staff, and Instruction," (3) "Works' Regulations and Social Provisions," and (4) "Purchase of Raw Materials and Sale of Bye-Products." Under the first heading, examples are given of the sheets actually in use in certain gas-works for daily records of working, and for the weekly and monthly reports. These examples, taken from German practice, are worthy of study by English gas engineers, though we do not suggest that they are superior in any essential points to the corresponding forms for works' reports in use in most gas-works in this country. Under the remaining headings, Herr Kobbert has not much to say directly interesting to English readers. As regards the sale of coke, however, he draws attention to the operations of the Industrial Union of German Gas-Works, having its headquarters at Cologne, a branch in Berlin, and an export office at Hamburg. This Union takes cognizance of the coke supply and demand throughout the country, and any gas undertaking having a surplus which cannot be disposed of to advantage in its own district is informed of the best market for the surplus, having regard to prevailing prices and freights. In this way suicidal competition is avoided, and even the smaller works have their interests well protected.

The fourth section of the book, on "Outdoor Services," is by Herr O. Meyer, of Dortmund. He deals first with the distributing system, secondly with public lighting, thirdly with consumers' connections, fourthly with consumers' fittings, &c., and fifthly with bookkeeping in connection with all these matters. We think Herr Meyer has handled them too sketchily for a work of this character. The calculation of sizes of mains, &c., is not considered, though it would appear to come appropriately enough in this section. Presumably in some other volume of the complete work there will be an exhaustive treatment of this question. The higher distributing pressures of modern times have rendered necessary reconsideration of the classic formulæ and tables; and we look forward to reading the judgment of authoritative German distributing engineers on their revision.

The fifth section, on the "Sale of Gas," has fittingly been entrusted to Herr K. Lempelius, the Director of the German Central Gas Publicity Bureau. He discusses conditions and rates of sale of gas, rebates, prepayment meter supplies, consumers' accounts, maintenance of gas appliances and fittings, lectures, classes, and exhibitions, and propaganda work generally. Under the latter heading, he describes the organization and work of the Publicity Bureau of which he is in charge. The section throughout is well deserving of careful study by all interested in the exploitation of gas supply.

The volume, as a whole, is sufficiently good to make us anticipate that the Schilling-Bunte "Handbook," when completed, will be a fairly exhaustive and valuable treatise on gas manufacture and supply from the German standpoint. We could have wished for a much broader and more cosmopolitan treatment than is promised by the performance of most of the authors in this initial volume of the "Handbook." To put the matter plainly, Herr Engländer is almost the only one of the five who has heeded anything in connection with gas supply outside Germany. In this respect, the work contrasts very unfavourably with an equally comprehensive one in another language which has just appeared, and of which the first volume is noticed fully on the previous page of to-day's "JOURNAL."

* Handbuch der Gastechnik," unter Mitarbeit zahlreicher hervorragender Fachmänner, herausgegeben von Dr. E. Schilling und Dr. H. Bunte. Band X, "Organisation und Verwaltung von Gaswerken," bearbeitet von J. Engländer, Fr. Greineder, E. Kobbert, O. Meyer, K. Lempelius. Munich and Berlin: R. Oldenbourg; 1914.

Ideal Refractivities of Gases.

This was the title of a paper, by Mr. W. Jacob Jones and Mr. J. Riddick Partington, presented to the Chemical Society. The following abstract of the communication appears in the "Chemical News:" An equation has been deduced which permits of the correction of observed refractivities of gases at normal pressure, $P_o = 760$ mm., and absolute temperature, $T_o = 273{\cdot}09$, for the deviations of the gases from the ideal state. This equation, which is based on Berthelot's characteristic equation, is:

$$\mu' - 1 = (\mu - 1)\left[1 + \frac{9}{128}\pi\tau\left(1 - 6\tau^2\right)\right]$$

Where μ and μ' are the observed and ideal refractive indices respectively, $\pi = P_o/Pc$, $\tau = Tc/T_o$ (Pc and Tc are the critical constants). In the case of the permanent gases, the correction is inconsiderable, but it is appreciable in the case of the more easily liquefiable gases.

Gas.	Wave-Length.	Refractive Index at N.T.P.	Ideal Refractive Index.
Hydrogen	589	1·0001392	1·0001393
Methane	589	1·0004410	1·0004403
Xenon	486	1·0007130	1·0007078
Carbon dioxide	589	1·0004498	1·0004467
Sulphur dioxide	589	1·0006760	1·0006628
Chlorine	589	1·0007730	1·0007608
Cyanogen	436	1·0008710	1·0008536

IRISH GAS MANAGERS' ASSOCIATION.

MEETING IN DUBLIN, AUG. 11.

PRESIDENTIAL ADDRESS of J. P. FITZPATRICK, of Maryborough.

Gentlemen,—It is with the greatest diffidence I presume to address you to-day. Coming, as I do, from a small works with a make of 5,500,000 cubic feet per year (not per day), I cannot feel other than nervous in addressing fellow-members so much better fitted to fill the position of President than I am. I can but feel that I am unique as a President. Although an Irishman, I have not the gift of speech-making, and coming from a small works, I am awkwardly situated as to what to speak about.

PAPERS BEFORE THE MEETING.

In the first place, I must thank you all very sincerely for the high honour bestowed upon me, and, in the second place, thank those gentlemen who have so kindly come forward with such valuable papers, at my request. These papers, I venture to say, will prove invaluable to an Association like ours, where the comparatively small works predominate, and be a valuable addition to the technical literature embodied in the past proceedings of the Association. Mr. C. B. Outon (an old favourite) gives his experiences of high-pressure lighting; and as he has had an exceptional chance for the exploitation of this system, his paper should prove of great interest to us all, and encourage us to introduce the high-pressure system where possible, and as opportunity offers, for street lighting and large installations, such as institutions, prisons, &c. Certainly, in these days of keen competition with electric lighting, and its introduction into the smaller towns, with the prospect of the economical half-watt lamp looming largely, distribution by high pressure seems to me to be the only way to send out our gas in the future. Even if we had no competition, high pressure is absolutely necessary for the efficiency of our high-power lighting, and for cooking, heating, and industrial gas appliances. In connection with this subject, and taking into account the fact that all our streets will be steam-rolled in future, I certainly am of opinion that our distribution mains should be of steel, with the "Rigid" joint caulked with lead wool.

Mr. Malcolm Littlejohn gives us an invaluable paper (on what may be termed an allied subject or sequel to that of Mr. Outon), dealing with efficient street lighting, &c. Coming from Glasgow, as he does, and with his experience in this public department of our business, his paper should prove of exceptional interest to all of us who have to deal with public lighting, and especially now with the lighting season coming on. Our street lighting, in my opinion, ought to be one of our best means of advertisement, and that without regard to actual profit.

Mr. C. B. Tully (another old favourite, whom I am glad to see again among us) has very kindly come forward with a paper on "The Newest Gas for Small Works"—a paper which, in view of high coal prices during recent years, ought to be of deep interest to us all, as being suitable for works in this country. I cannot see why small carburetted water-gas plants cannot be made to suit the requirements of even the very small works. They would be of great assistance, not only as a stand-by in case of sudden requirements, but as a means of lessening the price of gas and of increasing the price of coke. My idea is that a good deal of our tar (almost a drug on the market) could be used for enrichment of water gas, thereby steadying the price of tar. Irish anthracite washed coal could be used in the generators in place of coke, where coke has a ready sale at a good price.

Mr. M'Elwee, one of our new members, starts well by giving us a paper on his experiences in Australia—in the Western States. Some years ago we had a paper entitled "Gas Experiences in the West of Ireland." We are now having experiences in the West of Australia, which will, no doubt, prove interesting, as showing contrast in working with home works, and also show how world-wide the gas industry is, and how far it is from the extinction prophesied for it twenty years ago. In fact, all the papers submitted to-day show this. On all the papers I expect a keen discussion, as that is the way to get to the cream of every subject.

Being only in charge of a small works, I regret that I cannot boast of the big things I have done, or give any great account of the works of which I am manager, outside the ordinary routine—doing the best I can in pushing the business for my employers, pleasing consumers, reducing the price of gas whenever possible, steadily improving our plant each year, and always paying a fair dividend. I may say that I have the good fortune to work for a Company who, though small, never go in for cheeseparing, and always mark their appreciation in a substantial manner. My only regret is that such a Company has not a larger district to supply. Still, as Maryborough (unlike many Irish inland towns) is progressing, so my Company may hope to progress also, as we are doing at present.

COAL—QUALITY AND PRICE.

Coal, being our first requirement in gas making, deserves a few remarks. It has often seemed strange to me what a difference of opinion there is about the proper coals to use, and how reluctant some managers are to let their brethren know which coal has given them the best all-round results. I believe in buying the best class of double screened coals, with low ash and sulphur content, as being most suitable for small works. We have to pay the same freight and rail charges on cheap and bad as on good, clean coals; and the difference of 1s., or even 2s., per ton is a negligible quantity.

Considering the high price still asked for coals, I think a "ring" must exist among the colliery owners. Notwithstanding better pay and treatment of miners, there seems to me to be no reason or warranty for continued high prices. Colliery owners supplying gas coals seem to be worse in this respect than suppliers of house and steam coals. This is a matter of great importance to us all, as primarily affecting the price of gas, and demands judicious buying.

THE RETORT QUESTION.

In this country, with but few exceptions, where vertical retorts are on their trial, horizontal retorts with regenerative furnaces still hold the field in our carbonizing department. It is no little gratification to us to know that Widnes, which supplies the cheapest gas, still uses horizontal retorts. My own humble opinion and practice are that horizontal retorts (good settings) worked at high heats and heavy charges are still the best for small works.

A GREAT HANDICAP.

Although we are very much handicapped in this country by having to import almost all our requirements for gas making (and our plants), and especially as our coals cost so much more in comparison with England and Scotland, and, furthermore, having to supply comparatively small non-industrial communities, I am of opinion that it would pay a good many of our small, or even large, works to sell gas at a cheaper rate than they do. Some people say that the dearest coal gas in the world is in this country; but small works on the other side are more blameable in this respect. In England and Wales there are 220 works charging from 5s. to 6s. 8d. per 1000 cubic feet; in Scotland, there are 101 works charging from 5s. up to 8s.; in this country, there are 65 which charge from 5s. to 7s. 6d. Of course these figures refer to very small works in all cases, and go to show that cheapness of gas is largely a matter of output. There is an enormous field, even in this country, for a cheap gas of good calorific value, free from sulphur compounds, for cooking, heating, small intermittent power, and industrial uses in workshops, laundries, and factories.

The fact of having to import all our raw materials, combined with the fact that our people at home do not invest their capital in the gas business more than they do, seems to me to be the cause why our industry has been, and is, subject to a good deal of animosity, and regarded as an alien business. Perhaps the saying of a great Irishman, "Burn everything English but her coals," had something to do with it at one time, but nowadays it has not.

IRISH GAS INDUSTRY AND LOCAL GOVERNMENT.

This brings me to the question, What prospects are there for the gas industry under a Home Rule Government? You may, perhaps, think me rather previous in speaking of Home Rule, but my opinion is that Home Rule, self-government, or under whatever name it may be called, or by whatever political party it may be granted, is bound to come; and that very soon after peace is proclaimed we shall see both North and South in this country united in working a scheme of self-government on a sounder financial basis than the present one. One of the early effects of self-government, I am inclined to think, will be an increase in urban councils and the purchase at least of the smaller gas-works by local authorities, as even at present out of 110 works there are only 26 owned by local authorities. Whether this would be an advantage for the managers of these works is a debatable point; but as it would be an advantage to the industry generally, I have no doubt managers would be benefited also, providing the present system of the Local Government Board with regard to gas managers be entirely changed, and their positions as officials of the council recognized.

The passing of Bills under a Home Government should be less costly and tedious than at present, as they will be dealt with by our own people, who know the requirements of the country better than any outsiders would. Judging by the prosperity of Ireland during the time we had a Home Government, which is manifest to anyone who visits this city of Dublin and notices the beauty and architecture of the old buildings, we may again hope for a revival of prosperity on a larger scale when the new Government has got into proper working order. Our idle and ruined mills and factories throughout the country are almost as numerous as are our ruins of churches and castles. Ruins, deplorable as they may be, recall to us tragic memories of war and oppression, and are to us to-day also a memory of a time when this country was both prosperous and industrious, and in no way deserving of the name given it by those ignorant of its ways and manners—"the lazy Irish."

In this revival of prosperity it is only natural to presume our

industry is bound to share, especially in the uses of gas (and coke) for industrial purposes. We may see an object-lesson of the uses of gas for industrial purposes at the Inchicore Railway Works, where gas is used largely for wheel binding, tube brazing, tempering steel tools, &c. Increased prosperity means less emigration and an increased population, and therefore more opportunities for gas sales, quite independent of increased competition from electricity. In the small towns, at least, I cannot see why gas companies should not erect electric installations on their works and supply both gas and electricity to their customers, as they could afford to sell current cheaper than a rival electric company could, if started in opposition.

MUNICIPAL ELECTRICAL COMPETITION.

Gas-works owners generally do not fear electric competition by rival commercial companies; but unfair competition by public bodies running electric installations is an entirely different matter. In a great many towns gas-works owners are among the largest ratepayers. Competing with a rival electric installation owned by a local council, they often have to pay extra heavy rates to help their rival to damage the gas business. Gas-works owners generally have to pay well for their premises. Councils in many cases get old buildings cheaper, and, furthermore, are subject to no rates on their premises. It seems to me that the Local Government Board are rather too ready to grant loans for electric installations in small towns, and, furthermore, wrong in allowing electric cables to be run overhead on poles, instead of in subways, as in the cities. Much as we may regret it, the tendency is for the electric light; and I presume they want to cheapen the erection of plant and encourage its use. Ratepayers, however, ought to see how much they will have to pay for the luxury before they decide on dispensing with gas. In one town I know the urban council refused to purchase the local gas-works (a good going concern), as they regarded gas as obsolete and wanted an electric installation of their very own—or some of the prominent members did.

I would like to know how many municipal electric installations (after supplying as cheap a service as gas) have given a substantial amount each year in relief of rates equal to what municipal gas-works do, and, if any, how much. My experience of their working is that they do not give any relief to the rates, and periodically require extra loans for improvements.

On July 15 last, Mr. F. F. M'Gahon, J.P., ex-Chairman of the Dundalk Urban Council, read a paper, at the Civic Exhibition, on "Electric Lighting in Small Towns," quoting Dundalk as an example of a small town in which municipal electric lighting was a commercial success, and gave the following figures to back-up his statements:—

First year's working, June 1, 1912, to March 31, 1913.
Gross earnings, £2490. Working expenses, £1267.
Capital charges, £1386. Deficit, £163.

Second year's working, April 1, 1913, to March 31, 1914.
Gross earnings, £3838. Working expenses, £2224.
Capital charges, £1612. Deficit, £2.

He did not mention anything about a depreciation account. Even so it must be admitted that they are wonderful figures for a beginning, and show what municipal electrical competition is; and I cannot quite see that the undertaking has turned the corner financially yet. They have had an inquiry since for a further scheme involving a loan of £20,000, in addition to a first loan of £20,000; so it will be interesting to know in the next year how their finances will turn out, and the price chargeable per unit.

PROFITS AND RATE RELIEF.

Speaking of the profits of gas-works owned by public bodies being given in relief of rates, I consider this very unfair. Only a percentage of such profits should be given to the rates, and the remainder should be applied to improvements in plant, better salaries to officials, better wages and conditions to workmen, and reduction in price of gas to the consumers, who really make these profits. I am glad to see this matter has been receiving more attention of late years.

THE VALUE OF ALL-ROUND KNOWLEDGE.

To all young, and even to the older, managers of gas-works in this country, and to those who intend becoming gas managers, I strongly recommend the study, apart from ordinary gas-works practice, of chemistry. Our business is becoming more and more every day a very important branch of industrial chemistry, and the day has gone by for rule-of-thumb methods. All improvements, which enable us to make cheaper gas to-day, with coal at much higher prices than ever, we may, in a great measure, thank chemistry for. Drawing and mechanics should also be studied, as machinery is more in use, and will be more so in the future. As to modern electric practice, a knowledge more than superficial is required of our almost only competitor, and is extremely useful when one has to meet it, either as an ally or in competition. Current literature and the Gas Press should be studied, so as to keep up with all new ideas in the business generally. And lastly, the catalogues and illustrated price lists sent out by the large manufacturing firms should be examined and kept for reference. There is a good deal of information in this too often despised channel; and, if I remember aright, I am not the first President to say so. We have a good deal to thank the Commercial Gas Association for in this respect. I wish our Irish companies and owners of gas-works would advertise more than they do, and, if they have not show-rooms, hold small local gas exhibitions of their own about this time each year.

HARDSHIPS OF MANAGERS OF SMALL WORKS.

In the case of many of the small gas companies there is too much secrecy about the yearly balance-sheet. The manager never sees it, nor is he allowed into the meetings. This is a state of things which does not make for the progress or popularity of the company. It shows a want of confidence in the manager concerned, and does not tend to smooth working of the business. This class of company is generally looked after by a secretary who has been so long connected with his employers as to consider himself the manager. I know some of these small gas companies who would not allow their managers to attend meetings of this Association because they subscribe for a weekly gas journal, and the secretary suggested the manager could read all that occurred without losing his time to them for a few days. In this class of works no regular holidays are allowed; and in proportion as the work is hard the salary, or rather wage, is small. I just mention these facts as a preface to my remarks *re* managers of small works and the little attention they receive from their brethren in the business who are more favourably situated.

I do not think there are many more hard and worrying jobs than the managership of a small gas-works, with bad plant, an interfering secretary, and a penurious employer. The general public think such men have a nice position, but do not know that their work, especially during the winter season, is never done. Sundays are the same as other days, and many are often worked all night. These are the men who are really badly paid; and some of the salaries offered are too low, considering the testimonials that are required. After a small or any company or owners have got the plant into thorough working order, they should use good coal, and then pay their manager and men the best wages they can afford. The amount it would take to do this, owing to better service from employees, would not lessen their profits or increase the price of gas by a fraction. Managers of even small works should enjoy the confidence of their employers as much as a secretary does, and then these works would progress more than some of them do. Frequent changing of managers is a great mistake for any gas undertaking. It accounts for large leakage accounts, owing to want of examination and testing of mains, and especially owing to non-renewal of services, which I find are really the greatest source of leakage in our distribution of gas.

All owners of gas-works should not only allow their managers to attend the annual meeting of this Association, but should insist upon their doing so, and, in the case of small works, pay their travelling expenses. What is for the manager's benefit in these meetings is as much for the benefit of the undertaking he is engaged in. It is the meeting with brother managers, conversing with them and exchanging ideas and different experiences with regard to the business, that make these meetings of the Association so valuable, especially to the manager of a small gas-works. Companies or owners who try to prevent managers attending, instead of asking them to go, are certainly blind to their own best interests, as, by friendly advice from another manager, their manager may bring them back information about some portion of plant, coal to use, &c., which may mean money to them.

From these remarks, we can see that many managers of small gas-works in this country are not satisfied with their lot, and are always looking forward to better works, which they have earned by hard work and many a rough experience. It is no surprise, therefore, with chances of promotion few, that, when they do apply for better works in their own country, and fail to get it because an assistant or a foreman from a large works outside the country has got it, they grumble, and talk a good deal of importation of gas managers. This was so marked some time since that one of the gas journals remarked, "There was a good deal of 'Ireland for the Irish' with regard to gas managerships in Ireland." I am sure our friends in England, Scotland, and Wales would naturally grumble, as Irishmen do, if there were as many Irishmen securing managerships in their countries. Personally, I do not blame any outsider coming into this country and securing a good position, when he has better qualifications; but I certainly do blame some applicants from the other side who offer their services at a lower salary than advertised in order to secure the appointment. I am glad to say employers in this country do not favour applicants of this sort. The great majority of outsiders who have secured managerships in this country have put new life into the industry, and I venture to say we would not have an Irish Association of Gas Managers if they had not come over.

EDUCATION AND TRAINING.

Owners of works in this country have all along been at fault in the way they have looked after the training and education of their assistants and fitters. Much has been done of late in this direction; and as technical instruction improves in the larger county towns, at least we may look for great improvements in the education and training of all Irish applicants for managerships in the future. Even at present I do not think we need go out of the country to find managers capable of managing successfully any gas-works in the country. Technical instruction of gas-fitters, although badly needed, cannot be had outside our cities, as, unfortunately, our works are, in general, too small and isolated, and few in comparison with those on the other side of the Channel. How many of the larger works in this country have articled pupils to the gas business at the present day? I know there are a good

many in the electric business; so why should we, the older industry, lag behind in this respect? Or are we only living for our own time, and not caring in the slightest degree about the future of the business?

CONCLUDING REMARKS.

Before I close this rather erratic address, I must say a few words about our Association. I am not an optimist, neither am I exactly pessimistic; but I am of opinion that our Association wants to "buck up," to speak plainly. Take the matter of papers. I sent out about eighty applications to members for papers this year, and only obtained replies from about twelve. Two of the papers so kindly submitted to-day come from the other side of the Channel—from members resident there. There are about 112 eligible as ordinary members in this country, and only 80 out of the number are members. Were it not for our extraordinary membership, I fear the Association would not be in existence long, and attendance at meetings would not be up to the mark. I regret very much that the managers of the larger works in this country, with the exception of a few, do not attend the meetings of the Association, although they do attend the meetings of the Institution of Gas Engineers. "Charity begins at home"—not that we are out for charity; so ought membership of this Association. I think it shows great want of good comradeship that all the gas managers in this country do not join the Association (thereby making it a stronger one), and meet for the one meeting in the year in their own country to compare notes, or at least show the hand of good fellowship among us.

As we cannot have a separate Commercial Gas Association, all secretaries of gas companies, apart from managers, ought to be welcomed as extraordinary members of the Association. I would like to see our extraordinary members taking an active part in the discussions, where their knowledge of the subject may materially add to the value of the debate.

Another grumble, and I have done. We have as Secretary of the Association one of the most enthusiastic of our members, and during the past year I have gained an idea as to the enormous amount of work he does for the Association. When he sends out circulars to members, or forms to be filled up and returned, the least the members ought to do is to reply promptly, and so save him a great deal of unnecessary worry.

In conclusion, I thank you for your patient hearing of this rather rambling, and perhaps blunt, address, and trust you will take my remarks in the spirit in which they are intended—remarks which have for their object the increasing of progress in our industry, and more enthusiasm in the welfare of our Association—wishes which I know you all have at heart.

DETERMINATION OF SULPHUR IN SPENT OXIDE.

By HERBERT MARSDEN, B.Sc.

THE generally-accepted method for estimating sulphur in spent oxide is by extraction with carbon bisulphide; but considerable errors enter into this method through the solubility in CS_2 of certain organic substances—tarry matters and oils—amounting in some spent oxides to as much as 5 or 6 per cent. For this reason, when spent oxide is bought on the CS_2 method, the buyer often pays for more sulphur than he receives; and the author's object has been to devise a method which will get rid of the organic matter without incurring any loss of sulphur. It has been found that if the CS_2 extract is treated for a few hours with ordinary concentrated H_2SO_4 (sp. gr. 1·8) at the temperature of the steam-bath, the organic matter is decomposed. The decomposition products can be eliminated without the slightest loss of sulphur.

The method is as follows: Weigh off 5 grammes of the oxide; carefully transfer to, and wrap in, a filter-paper; and put into a Soxhlet tube. Extract with CS_2 in the usual way into a weighed, dry flask of about 250 c.c. capacity. Dry the flask in an oven to expel all traces of CS_2; cool, and weigh. Add from 10 to 20 c.c. of concentrated H_2SO_4; cover the flask with a watch-glass to prevent the escape of a little sulphur by sublimation; and leave on the steam-bath for four hours or more. Then carefully add about 200 c.c. of distilled water; filter; transfer the sulphur from the flask to the filter; and wash till free from H_2SO_4. The small amount of sulphur which adheres to the watch-glass and to the sides of the flask can easily be removed by rubbing the surface with a little damp filter paper, and put with the rest of the sulphur. Dry, put the filter and its contents into a Soxhlet tube, and extract with CS_2 as before. The sulphur obtained will be found to be perfectly clean.

It is advisable to put a few pieces of broken porcelain or pumice (not too small) in the flask, to prevent bumping.

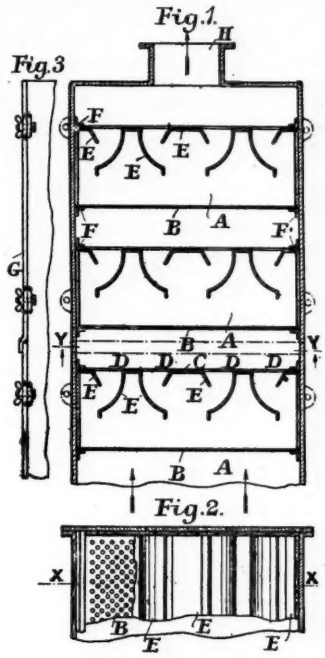
While the first extract is being heated with H_2SO_4, some SO_2 is evolved—due solely to the action of the acid on the separated carbonaceous matter. Pure sulphur, treated in exactly the same way, even for some days, undergoes no loss whatever through being heated with the acid.

If the first extract is weighed as well as the second, the difference in weight will give the amount of organic matter soluble in CS_2. Unless this is required, it is not necessary to weigh the flask until the second extraction.

GAS-CLEANSING APPARATUS.

In the last number of the "JOURNAL" a description was given of a gas-purifier devised by Herr Carl Heine. He has also patented for France an apparatus for cleansing and purifying gas, air, fumes, &c.; the solid or liquid particles being separated. The following particulars are taken from the French specification [No. 466,459].

The apparatus is composed of a number of elements which are assembled in such a way that they can be easily separated from each other; but they are so constructed that each can by itself act as a separator and purifier.



The invention is shown, by way of example, in the accompanying illustrations. Fig. 1 is a longitudinal section of the apparatus on the line X of fig. 2, which is a transverse section on the line Y of fig. 1. In fig. 2 a portion of the inlet side of the separator element is supposed to be removed in order to show the arresting surfaces within. Fig. 3 shows how the lid of the apparatus is kept in its place.

In the form of apparatus illustrated, the various separator elements A have the shape of empty boxes, and are made of sheet iron or other suitable material. The partition B, through which the fluid to be purified enters the separator, is perforated with holes. The opposite side C, through which the fluid passes out, is also perforated, but with larger holes D. These are covered by impact surfaces E, so placed that their projection covers the entire surface of the holes, which are thus masked. The elements A all have the same outside dimensions, and are surrounded by a casing; and blocks or guide-bars F keep them at a suitable distance from each other. One side of the casing is mounted so that it can be easily taken off. This forms a lid G, and is divided into a number of plates (varying with the dimensions of the casing), which can be separately removed by loosening the screws.

The action of the apparatus is as follows: The fluid to be cleansed enters through an inlet-pipe not shown, as it is on the side of the part supposed to be removed. The fluid then runs through the sieve which serves as the bottom of the first separator, and, as the result of the impact, the solid or liquid substances entrained are removed. When the fluid has penetrated into the separator, it cannot directly escape by the holes D, and impinges against the surfaces E before it can do so. The same thing occurs in the succeeding elements. When the fluid has passed through them all, it flows out through the opening H, upon which is branched the pipe conveying it to the place of utilization.

The number of elements can be varied in accordance with the quantity of fluid to be cleansed; and the mode of constructing them can be modified. The apparatus renders it possible to remove the elements for cleaning, repairs, &c., without stopping work for any great length of time.

Gas Used in Salt-Refining Processes.—During an inspection by the Belfast Association of Engineers of the works of the International Salt Company, Limited, at Carrickfergus, it was shown that the salt-refining furnaces are heated by gas; and under the intense heat thus produced the rock salt could be seen trickling down into the revolving pans, and forming into fine crystals in the space of a few minutes. The gas-producers and power station claimed a good deal of attention from the visitors.

SOME STATISTICS OF THE GAS INDUSTRY IN THE UNITED STATES.

By GILBERT C. SHADWELL, Statistician of the National Commercial Gas Association of America.

The compilation of reliable data and statistics in so large a country as the United States is, of necessity, a difficult task. That there must be errors is a foregone conclusion. Such errors may be brought about in several ways. An example would be incomplete data furnished, due probably to a mistaken idea that figures given out may act detrimentally to the company in question, or due to lack of system in not having at hand the information asked for. This may often necessitate an estimate (not always very correct) by the person asking for the information. Further, consolidated gas and electric companies may not always be able to apportion the capital and so forth exactly to each division of their organization. In this connection, however, it will be of interest to learn that the National Commercial Gas Association has on hand the systematic compilation of all such data as not only will help companies in showing what general and specific progress is being made, but will bring before them the direction in which new business may be obtained.

summarized in certain tables presented in connection with the text, while other tables give statistics in detail by states. Special tables are also presented in which statistics for the industry are classified according to character of ownership, size of establishment, number of wage-earners, and prevailing hours of labour; while still another set of tables give detailed information in regard to the quantity and value of the products, the mileage of gas-mains, and the number of stoves and heaters connected with the mains. The returns relate to the calendar year 1909, or the business year corresponding most nearly to that calendar year, and cover a year's operations, except for establishments which began or discontinued business during the year.

It is mentioned that the word "establishment" generally represents a single plant. In some cases, however, it represents two or more plants operated under a common ownership, or for which one set of books of accounts is kept. If, however, the plants included under one establishment are not all situated within the same city or state, the statistics have been separated

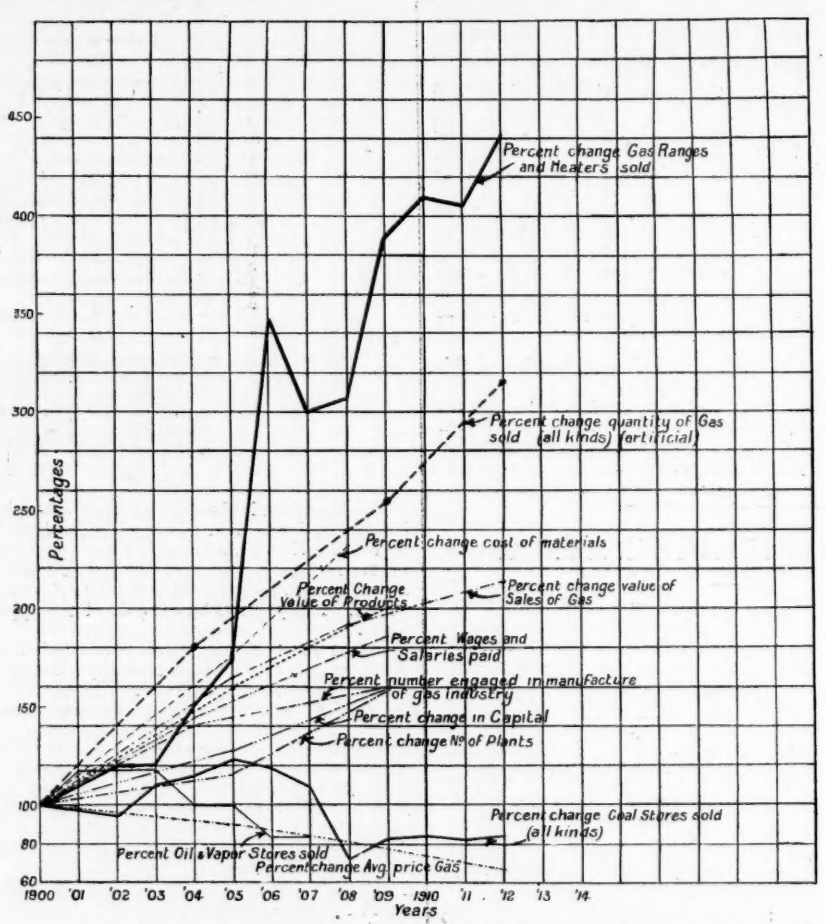

Percentages
Years
Percent change Gas Ranges and Heaters sold
Percent change quantity of Gas sold (all kinds) (artificial)
Percent change cost of materials
Percent Change Value of Products
Percent change value of Sales of Gas
Percent Wages and Salaries paid
Percent number engaged in manufacture of gas industry
Percent change in Capital
Percent change No. of Plants
Percent change Coal Stores sold (all kinds)
Percent Oil & Vapor Stores sold
Percent change Avg. price Gas
450
400
350
300
250
200
150
100
80
60
1900 '01 '02 '03 '04 '05 '06 '07 '08 '09 1910 '11 '12 '13 '14

Fig. 1.—Percentage Change in Important Items Involved in the Gas Industry.

At the present time the wider statistics available are to be found in the census reports and in the reports of the United States Geological Survey by Mr. E. W. Parker. The figures and diagrams given in this article are derived mainly from these reports; but it should be borne in mind that, although undoubtedly sincere efforts have been made to give reliable data in the compilation of these reports, estimates have had to be made in certain cases. In fact, in reply to a letter sent by the National Commercial Gas Association to Mr. Parker, he states that in the case of the figures given for gas used for fuel and for lighting, estimates had to be made in several instances. Nevertheless, although there may be some error in the results obtained, the general effect shows rather clearly the progress made, and with a fair degree of accuracy.

In this article the diagrams should be followed in every case, with the context. Readers should keep in mind that in Mr. Parker's report the figures include coke-oven gas, whereas in the United States census report this is not included (except in a few instances); but it does include acetylene, &c., as described.

The statistics for the manufacture of gas given in the Thirteenth (1910) Census of the United States show figures for the manufacture of gas for illumination and heating purposes for the calendar year 1909. The general results of the census inquiry are in order that the results may be in accordance with the general method of the census report.

In the introduction to the report details are also given of persons engaged in the manufacturing industries; but it is pointed out that the census did not make any attempt to ascertain the number of employees working certain hours per week nor the general details regarding hours of labour. Notes are given on the cost of manufacture and profits.

The classification "Gas—Illuminating and Heating" covers establishments making gas for sale for light, heat, and power, including some establishments operated by municipal governments. It covers the production of gas by various processes, including the destructive distillation of coal, wood, resins, oils, or other carbonaceous substances; the action of steam on incandescent carbon or carbon-containing substances; the volatilization, or cracking, of petroleum or the petroleum distillates; and the action of water upon substances like calcium carbide.

Mention is made of the fact that the figures do not include many residences, hotels, and mercantile establishments having plants for making acetylene or other gas for light, heat, and power, and many manufacturing and other industrial concerns which make gas (usually "producer" gas) in large quantities for use as fuel in their own establishments.

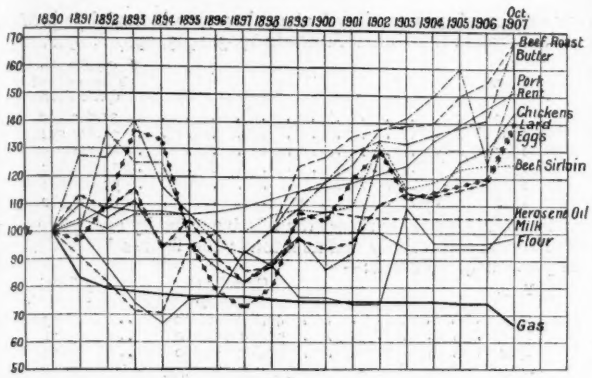


Fig. 2.—Percentage Rise in Commodities and Fall in Price of Gas by Years.

The gas produced in bye-product coke plants is not generally mentioned in the report; but details of this are given in the treatise by Mr. Parker upon "The Production of Gas, Coke, Tar, and Ammonia at Gas-Works and in Retort Coke-Ovens and of Gas and Tar at Water-Gas Works in 1912," published at Washington in 1913. Details of establishments which sell gas which has been purchased from establishments that manufacture it, have not been included. It thus appears that no duplication has crept in.

The number of merchandizing companies other than manufacturers was reported as being 51 in 1909; the total capital of these establishments was $15,297,324; and the quantity of gas sold by them was 3,273,618,000 cubic feet, having a value of $3,605,635. Their receipts from rents, and sales of lamps and appliances, was shown as $19,843, and from all other products, $38,719.

Establishments in the industry produce not only straight coal gas, straight water gas, carburetted water gas, mixed coal and water gas, oil gas, and acetylene gas, but also (as bye-products) tar, pitch, benzol, hydrocarbons, ammonia water, sulphate, coke, cyanides, and other products.

There is so much interesting and valuable information given in these reports that special reference is desirable, if not essential, for the complete and proper understanding of the subject.

The following figures are given in the United States census report on the manufacture of gas, and show the progress made to 1909:

Year.	Number of Establishments.	Capital.	Value of All Products.
1850	30	$6,674,000	$1,961,746
1890	742	258,772,000	56,987,000
1900	877	567,000,000	75,717,000
1905	1019	725,000,000	125,145,000
1909	1296	915,537,000	166,814,000

Diagram No. 1 shows the percentage change in the quantity of gas sold, cost of materials for gas manufacture, value of products, value of gas sales, wages and salaries paid, number employed in the industry, capital, number of plants, the average price of gas and the percentage change in gas-ranges, oil and vapour stoves, and coal stoves and ranges sold by years.

Considering the manufacturing side the increase in the number of plants is not, of course, a real estimate of the growth of the industry, in that in certain cases previously existing plants have since been absorbed by other companies. From the figures here shown, however, and from the curves derived therefrom, the increase from 1900 to 1910 is about 40 per cent. in the number of establishments, as compared with 18 per cent. from 1890 to 1900. Again, the increased annual production was about 120 per cent. in 1900 to 1909; while from 1890 to 1900 the increase was about 33 per cent. The capital increase, as will be seen, was only a little greater in 1900-1909 than for 1890-1900.

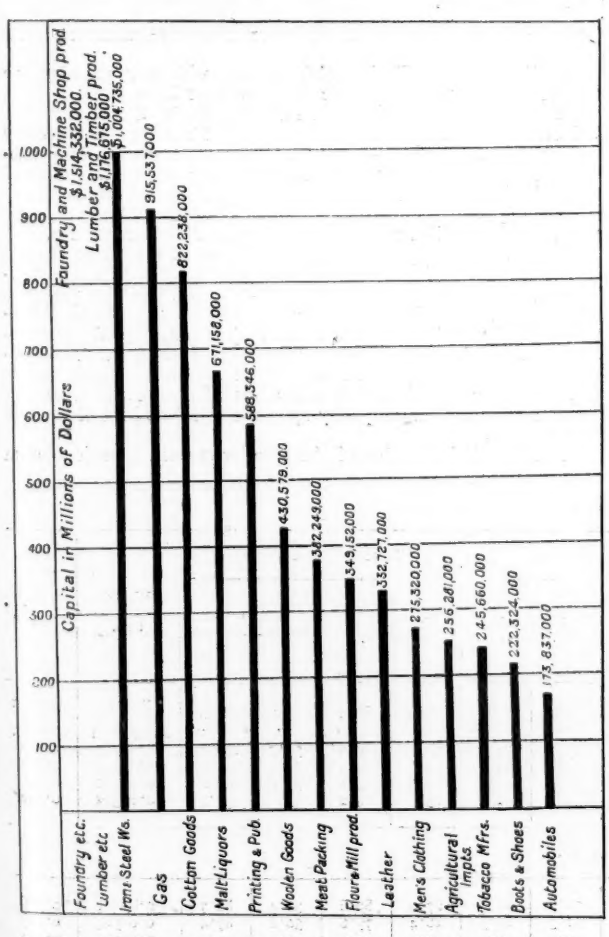


Fig. 3.—Comparison of Gas Industry with Some Other Straight Manufacturing Industries.

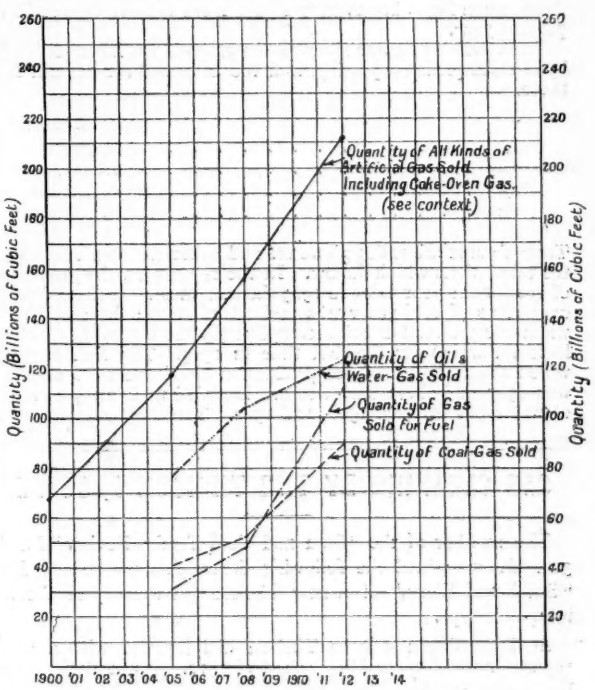

Quantity (Billions of Cubic Feet)
Quantity (Billions of Cubic Feet)
Quantity of All Kinds of Artificial Gas Sold Including Coke-Oven Gas. (see context)
Quantity of Oil & Water-Gas Sold
Quantity of Gas Sold for Fuel
Quantity of Coal-Gas Sold
1900 '01 '02 '03 '04 '05 '06 '07 '08 '09 1910 '11 '12 '13 '14

Fig. 4.—Quantities of Each Kind of Gas Sold by Years.

With regard to the stoves, &c., sold, the actual figures (as given by Mr. Barbour in his paper read before the Association, and as since completed by him) show the following for 1900:

Coal-stoves, &c.	3,480,000
Oil-stoves, &c.	300,000
Gas-stoves, &c.	200,000

The growth of the gas industry is indeed remarkable. The curve showing the percentage sales of gas-ranges alone indicates a wonderful increase, whereas the corresponding percentage curves for oil and coal heaters show a decline.

It is interesting to note the rise in the price of wages and commodities compared with the fall in the price of gas. Diagram No. 2 is self-explanatory.

In an interesting paper by Mr. J. W. Lansley appearing in the "Gas Record" of April 22 last some comparisons were given taken from the above-mentioned sources, the figures taken from the Thirteenth United States Census showing the comparison of the gas industry with that of other industries is interesting, and has been formed into fig. 3. The value shown under "Gas" is that for illuminating and heating purposes, and includes all plant capital.

The convenience and adaptability of gas for light, heat, and power is being recognized more fully each year. Moreover, it is believed that, when later figures are available, the increase in its use will be indicated to an even more marked degree.

It may be interesting in this connection to quote from the article above mentioned: "The annual product of the artificial gas industry in the United States during 1909 (166,814,000 thousands; the value of the gas itself being $138,615,309) may be termed as a gas bill of right smart size. It is greater than all the petroleum produced in this country during the same year

($128,328,487); greater than all the gold ($99,673,400) and all the silver ($28,455,200); it is over $100,000,000 greater than the value of all the natural gas ($63,206,941); greater than the value of all the Pennsylvania anthracite coal mined in the same year ($149,181,587). It is practically two-fifths as great as the value of all the pig-iron ($419,175,000) or all the coal other than Pennsylvania anthracite ($405,486,177) taken from the earth during the same twelve months."

Chart No. 3 gives a general idea of the position of the gas business in connection with a number of other straight manufacturing industries.

With regard to the effect of differential and sliding-scale rates on the use of gas as a fuel, it would appear from the figures and diagrams which are included in this article that such rates have had a beneficial effect on sales in this field. Here, of course, the factor of service rendered enters largely into account; and the question of rates becomes one of great importance. It is very difficult to judge how far the apportionment of gas for lighting and fuel as given in Mr. Parker's report is correct. The Association has made inquiries on this matter of the United States Geological Survey, but no very satisfactory result has been arrived at, other than that estimates had to be made in certain cases. These figures, therefore, have not been included in this article.

It should be borne in mind in this connection, that in gas used for domestic purposes the gas for lighting and for fuel passes through the same meter. The Statistical Department of the Association hope, however, to obtain more definite figures in the present year.

The following figures show all the gas sold for fuel and lighting by the companies reporting, and the diagrams are set out from these.

Year.	Cubic Feet Sold.
1900	67,093,553,000
1905	117,866,000,000
1908	156,909,310,000
1912	212,391,168,000

These figures are split up into oil and water gas and coal gas, in the tabulations which follow. In the reports on the production of gas for the year prior to 1905 the statistics were limited to the operations of coal-gas works and retort-ovens; the statistics of water-gas production being compiled (by the United States Geological Survey) for the first time in 1905. The first year for which the statistics of the production of oil gas were collected was 1907, and these statistics are included with the production of water gas in 1907, 1908, and 1912. The following shows the quantities of gas produced at coal-gas works and bye-product coke-ovens in the United States in 1903, 1905, 1907-8, 1912.

Year.	Quantity in Thousands of Cubic Feet.
1903	31,049,462
1904	34,814,991
1905	40,454,215
1907	54,819,685
1908	53,561,811
1912	89,693,372

The following table shows the relative gains by coal and water and oil gas respectively and as a total; the figures being derived as previously indicated:—

Year.	Quantity of Coal Gas.	Total Per Cent.
1905	40,454,000,000 ..	34·3
1908	53,561,813,000 ..	34·1
1912	89,693,372,000 ..	42·2
Year.	**Quantity of Oil and Water Gas.**	**Total Per Cent.**
1905	77,412,000,000 ..	65·7
1908	103,347,397,000 ..	65·9
1912	122,697,796,000 ..	57·8

Fig. 4 shows these changes. It is most important to note that coal gas and coke-oven gas have not been separated in Mr. Parker's report; and this should be borne in mind when following out the figures he shows. The figures given include coke-oven gas sold to gas companies at a very low price. This, it should be remembered, has to be enriched and treated before it can be sold to consumers. Therefore, the average prices given cannot be taken as the actual average retail prices of the gas.

General interest is being taken at this time in the rapid rise of gas company bonds and stocks. The reasons for this are based upon three fundamental factors: (1) Security; (2) business expansion; (3) advanced commercial practice. These points are fully recognized by the financial authorities.

Mr. Lansley quotes from Mr. Lawrence MacIntyre as follows: "Gas bonds merit the very highest degree of confidence. While it has been impossible to get the exact figures, there is in the neighbourhood of $400,000,000 invested in the mortgage debts (or their equivalent) of gas companies in the United States; and of this enormous amount there is probably less than 1 per cent. of the interest in default—a record not equalled by any form of investment other than United States Government Bonds."

A gas company's plant is something entirely tangible. These points alone show the importance and strength of the gas industry; and its continued advance is a matter on which there can be no doubt.

GAS CLEANING BY THE THEISEN PROCESS.

The number of the "Iron and Coal Trades Review" for the 31st ult. contained the following description, abstracted from "Stahl und Eisen," of a new Theisen gas-washer, of the disintegrator type.

At Differdingen a large Theisen disintegrator with a water separator was installed at the end of 1912. It was designed for the preliminary cleaning of blast-furnace gas at the rate of 40,000 cubic metres (1,412,590 cubic feet) per hour, reducing the dust content from 4 grammes per cubic metre (1·736 grains per cubic foot) to 0·3 to 0·5 gramme per cubic metre (0·1302 to 0·2170 grain per cubic foot). In actual working, however, it was found that the gas as it came from the blast-furnace had a dust content of only 0·88 to 1·46 grammes per cubic metre. It should be noted that the total power consumption given in Table I. includes a comparatively high suction and pressure, and would be substantially lower with smaller pressure variations.

At Rombach two Theisen disintegrators with an output of 30,000 cubic metres (1,059,440 cubic feet) per hour have been at work, one continuously, for fourteen months. Tests of this plant are given in Table II. In this case the output has been measured by three different methods—(1) by a hydro apparatus specially calibrated for the purpose; (2) by a Rabe tube; and (3) by means of a gasholder of 4000 cubic metres (141,259 cubic feet) capacity and 80 mm. (3·14 inches) water pressure. The fact that the pressure in disintegrator No. 2 is less than that in disintegrator No. 1 is explained by the presence in the former of a washing surface built concentrically around the pressure fan for experimental purposes. The higher power consumption in No. 2 is due partly to greater amounts of water and also to the presence of the above-mentioned washing surface, which may be considered partly recovered in the way of greater cleanness of the gas. The temperatures show that with nearly equal entrance temperature of the gas and water there is a slight rise of the heat in the water and the gas, originated partly by conversion into heat of work in the washer.

Another disintegrator of the counter-current type is now at

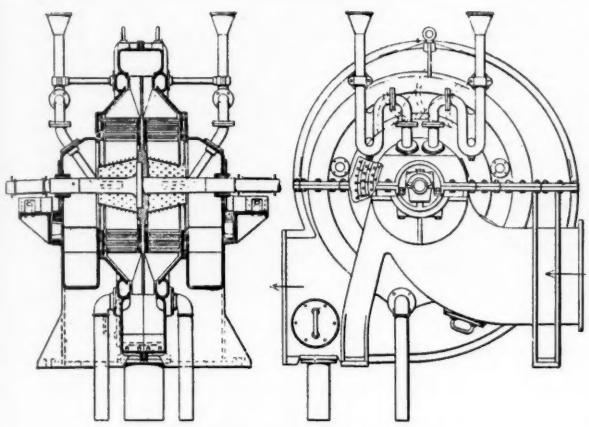
TABLE I.

Gas Volume Referred to 50° C. (122° Fahr.),	Gas Pressure.		Pressure Rise.	Dust Content in Gas.		Gas Temperature.				Temperature of Water.				Water Consumption.	Total Power Consumption
	In Suction Pipe in Front of Washer.	Between Water Separator and Washer.		In Front of Washer.	After Passing Washer.	In Front of Washer.		After Passing Washer.		In Front of Washer.		Behind Washer.			
Cubic Feet per Hour.	Mm. of Water.	Mm. of Water.	Mm. of Water.	Grammes per Cub. Met.	Grammes per Cub. Met.	Deg. C.	Deg. Fahr.	Deg. C.	Deg. Fahr.	Deg. C.	Deg. Fahr.	Deg. C.	Deg. Fahr.	Gallon per Cubic Foot.	H.P. per 1000 Cub. Ft.
1,571,742	− 70·5	130·3	200·8	1·08	0·020	40·0	104·0	40·5	104·9	30	86·0	39·3	102·8	0·00513	0·157
1,672,245	− 90	150	240	1·0	0·012	32·5	90·5	33·5	92·3	29	84·2	33	91·4	0·00416	0·154
1,716,460	− 85	153	238	0·944	0·018	33·3	92 0	34·5	94·1	29·5	85·1	33·8	92·8	0·00412	0·148
1,649,539	− 85	158·3	243·3	0·880	0·008	32·5	90·5	33·5	92·3	29	84·2	33	91·4	0·00322	0·142

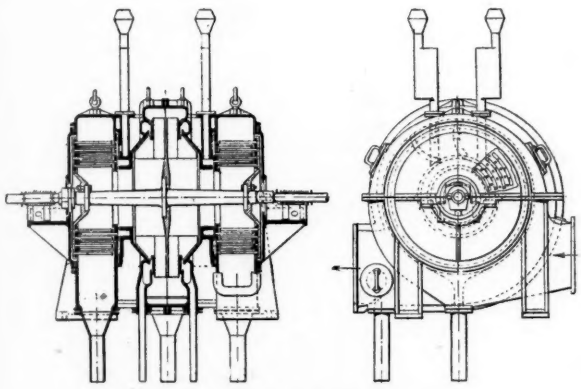
TABLE II.

1,068,963*	− 30·0	196·5	226·5	0·22	0·014	29·0	84·2	31·0	87·8	27·0	80·6	30·4	86·7	0·00411	0·116
1,074,261*	− 22·9	137·1	160·0	0·35	0 016	30·6	87	31·3	88·3	26·4	79·6	30·8	87·4	0·00524	0·127
1,520,288*	− 55·0	130·0	180·0	—	—	—	—	—	—	—	—	—	—	0·00290	0·082

* Referred to 20° C. (68° Fahr.) and 760 mm. pressure.



Theisen Washer—Central-Current Type.



Theisen Washer—Counter-Current Type.

work in Austria. There an interesting comparison was made between a Theisen disintegrator and one of the Schwarz-Bayer type. Both cleaners take the raw gas from, and send the cleaned gas back into, a common pipe. The dust content of the raw gas, the pressure of the latter, and the pressure in the cleaned gas piping are therefore equal for both appliances. The output and power consumption in both are also practically equal, while the water consumption and the degree of cleanness are shown in Table III.

TABLE III.

—	Water Consumption.	Cleanness of Gas.
	Grammes per Cubic Metre.	Grammes per Cubic Metre.
Theisen disintegrator	0·7 to 0·9	0·03 to 0·06
Schwarz-Bayer disintegrator . .	1·3 to 1·5	0·30 to 0·50

These experiments appear to show that the Theisen disintegrator, under equal conditions of operation, works with about half the water consumption, and about a ten times higher degree of cleanness, as compared with the Schwarz-Bayer disintegrator. As regards space requirements and reliability of operation, the Theisen disintegrator is also materially better, since it requires only a direct-coupled 125 H.P. motor, while the other type requires two motors of 35 H.P. each for the disintegrator and another motor of 60 H.P. for a separately-driven fan.

In the notice which appeared in the "JOURNAL" last week of the programme of the City and Guilds of London Institute for the session 1914-15, it was mentioned that it contains the names of the registered teachers in the various technological subjects. We are sometimes asked to indicate the centres at which classes are conducted by them; and this we are able to do in the case of Mr. Ernest Scears, Assistant to Mr. W. E. Price, the Engineer and Manager of the Hampton Court Gas Company. Mr. Scears delivered throughout last session lectures on "Gas Supply" at the Kingston-on-Thames Technical Institute, the Acton and Chiswick Polytechnic, and the Guildford Technical Institute, with exceptionally good results. Of the sixteen candidates examined at the Kingston Institute, twelve passed in Grade I. and two in the Final; at the Acton and Chiswick Polytechnic, ten out of the twelve candidates passed in Grade I.; while at Guildford only one of the five candidates failed to pass in that grade. Intending students residing in the localities may be glad to avail themselves of the classes at the institutions named.

COLOUR OF SOURCES OF LIGHT.

In one of the "Notes from Abroad" in the "JOURNAL" for the 24th of March last, reference was made to a lecture delivered by Dr. L. Bloch, before the German Illuminating Engineering Society, in which he reviewed existing methods of determining the colours of artificial light sources, and described a simplified process for representing them numerically and graphically. The subject was also dealt with in a paper read early in the present year by M. de Decker, before the Antwerp branch of the Société Chimique de Belgique; and an epitome of his communication appeared in the "Bulletin" of the Society for June. After a brief historical account of the methods—spectrophotometric, colorimetric, and polarimetric—and apparatus hitherto used, the author described the method proposed by Dr. Bloch. It consists in taking the photometric readings through coloured glasses—green, red, and blue—their permeability to the luminous rays being exactly defined. The Lummer and Brodhun street photometer was used by Dr. Bloch, who, with two whole numbers, was able to specify any source of light. These numbers express the green-red and the green-blue ratio (green being taken as 100) in percentage of the intensity of daylight in cloudy weather, determined in the same conditions. M. de Decker presented some diagrams and tables compiled by Dr. Bloch, and drew attention to their practical importance. The apparatus used is very simple, and can, it is stated, be adapted to all Lummer and Brodhun prism photometers.

REGISTER OF PATENTS.

Bye-Product Recovery Gas-Producers.

RIGBY, THOMAS, and ANDREW, G. W., of Dumfries, and WETCARBONIZING, LIMITED, of Dean Farrar Street, Westminster.

No. 10,981; May 9, 1913.

This invention relates to the recovery of volatile bye-products—such as methyl alcohol—by cooling in surface condensers the gases evolved in the gasification of peat. The object aimed at is to modify the method of treatment of the gases evolved from gas-producers in which gasification is effected under Mond or ammonia-recovery conditions—that is, by combustion with a limited supply of air in the presence of steam—in order to permit of the efficient recovery of such bodies when gasifying peat in producers of the type in question. The invention consists in facilitating the recovery of the volatile bye-products by effecting their condensation by the indirect cooling of the gases in a stage subsequent to, and separate from, the condensation of bye-products that have a boiling point higher than that of water.

In working bye-product recovery gas-producers of the Mond type, the patentees remark, large quantities of steam are supplied to the producers, not only for the purpose of enriching the gas and limiting the temperature of combustion in the producer, but of providing an excess of steam with which uncombined nitrogen in the fuel can form a further quantity of ammonia. The greater part of this steam passes through the producer undecomposed, and issues with the producer gas, from which it has subsequently to be separated before the gas can be properly consumed. Usually such separation is effected by circulating a suitable liquid (say, water) in direct contact with the producer gas, for the purpose of cooling the latter and condensing the accompanying steam; the heat thus gained by the cooling liquid being then utilized by bringing the liquid into direct and intimate contact with the air supply on its way to the gas-producers. In this way, the warm cooling liquid is cooled by the air; and the latter is saturated with water vapour, whereby a great part of the steam required for the gas-producers is recovered.

As the cooling liquid circulates continuously in a closed cycle between the gas-cooling and the air-heating apparatus, the cooling of the gas is dependent upon the amount of heat and water vapour taken up by the air, with the result that in practice the temperature of the gas leaving the cooling apparatus is in the neighbourhood of 66° C., and the gas passes away saturated with water vapour at the exit temperature of the cooling apparatus. As a result of working a gas-producer by this method (besides the usual tar and ammonia), a certain quantity of volatile bye-products—for instance, methyl alcohol when using peat fuel—is lost in the cooling liquid.

The apparatus for carrying out this process is not illustrated by the patentees; but they remark: The plant may be substantially similar to that already indicated; but with this exception—that cooling of the gas to effect condensation of the required bye-products is carried out in one or more surface condensers subsequently to, and separately from, the condensation of products of higher boiling plant than water; the temperature being lowered to such an extent that the steam in the gas is condensed, while any tar or methyl alcohol condensed with the steam collects in the water of condensation, from which the methyl alcohol or other bye-products soluble in water can be subsequently separated.

The cooling of the gas in the surface condenser may be carried to such a temperature as usually exists at the outlet of the gas cooling apparatus in a Mond-gas producer plant; and if cooling to atmospheric temperature is desired to recover further quantities of bye-products, this is preferably effected in separate air-cooled condensers.

According to another method of carrying the invention into effect, the gas issuing from the producers is maintained in direct contact with the cooling water or other liquid as hitherto; but with this variation—that the temperature of the gas at the exit of the apparatus is maintained sufficiently high to ensure that substantially none of the soluble volatile bye-products desired is condensed in the cooling liquid, but leaves

the gas cooling apparatus with the producer gas, to be afterwards recovered in surface condensers.

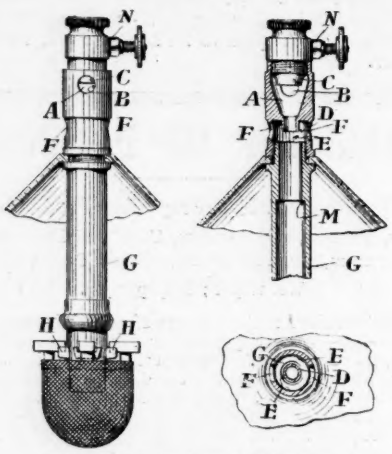
The control of the gas temperature can be effected by varying the cooling effect which the air on its way to the producers has upon the cooling liquid; it being understood that, as the temperature of the producer gas at the exit of the cooling apparatus depends upon the quantity and temperature of the cooling liquor (which latter in turn depends upon the quantity of heat taken up by the air) a reduction of the quantity of heat so abstracted will effect an increase in the exit temperature of the producer gas.

Incandescent Gas-Burners.

WILDBORE, J. E., of Oldham.

No. 14,902; Dec. 27, 1913.

This invention relates to that type of incandescent gas-burners which have a number of superposed gas and air mixing chambers and nozzles projecting into them, and in which the primary chamber is conical and has lateral air inlets in alignment with the outlet orifice of the nozzle projecting into the chamber. The patentee states that his object is "to provide a construction of burner, which, besides producing a perfect mixture of gas and air, also keeps the burner free from fluff and dust, dispenses with any air regulator and gauze at the nozzle, is suitable for all gas pressures, and prevents back-lighting at the gas-regulator."



Wildbore's Incandescent Gas-Burner.

The ordinary or primary mixing-chamber A is, from the top to the bottom, internally conical, and with a nozzle D at its narrow end projecting into the secondary cylindrical mixing-chamber E formed in front of the ordinary or primary mixing-chamber, into which latter projects the gas-supply nozzle C. Both these chambers have the usual lateral air inlets B F—the inlets B being, however, formed in the conical part of the chamber A. Both nozzles C D extend into the chambers A E approximately half-way past the respective air inlets, so as to cause the air inlets of each chamber to be in alignment with the outlet orifice of the respective nozzles, and thus cause the air entering through the inlets in both cases to mix immediately with the gas on its issue from the nozzles, so that "a more perfect mixture is obtained." The second or auxiliary mixing-chamber E also produces a current which causes any dust or fluff ordinarily liable to accumulate on the burner to be drawn in through the respective air inlets and to be burned—thus ensuring a regular air supply and a perfect mixture of gas and air.

The pipe G, screwed into the chamber E and furnished at its lower end with a mantle-carrier H, is formed internally of two different diameters, with a shoulder M between so as to allow the mixture of gas and air to expand towards the outlet and prevent back-lighting at the gas-regulator N

Regenerative Gas-Furnaces.

SIEMENS, F. K., of Queen Anne's Gate, S.W.

No. 28,049; Dec. 5, 1913.

This invention, relating to "regenerative gas-furnaces having a uni-directional heating flame," consists of an improvement in, or modification of, the invention described in Patent No. 10,824 of 1912 as improved upon or modified by No. 17,956 of 1913, wherein the gas and air flues communicate with each other, through openings or narrow passages, in such manner as to result in the formation of a flame at various points within the furnace; one of such flames being the uni-directional heating flame of the furnace; while the other flame or flames serve to heat the regenerators.

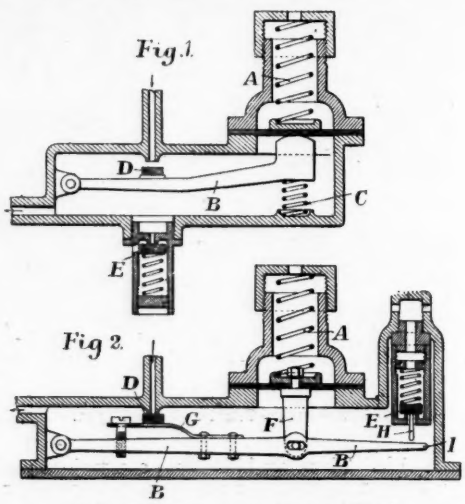
The invention is described with reference to three sheets of drawings, showing many modified constructions. In one, the preheated air, immediately after leaving the hot regenerator chamber, divides into two streams; the main part, which supports combustion of the heating flame, passing through a passage towards the inlet port of the furnace hearth; while a comparatively small volume of the air flows through another passage into the gas-flue "where combustion is initiated." Of the air which passes to the inlet port, the main part combines with the gas from the gas-flue and produces a uni-directional regenerative flame traversing the furnace hearth; while the remainder flows around the end of a partition wall and, passing through an opening, reaches the cool regenerator chamber which has to be heated. This pure air mixes with, and serves to burn, a portion of the gas which issues from the gas-flue through a vertical duct—"thus producing a flame at this place serving to reheat the regenerator." Upon the flow of air being reversed, the same operation takes place, but in the reverse directions. The hot air from the regenerator branches into a main stream and a smaller one; the latter passing upwards through a passage to initiate combustion in the gas-flue, while the main stream itself again divides into two—part providing the oxygen required for the production of the heating flame of the furnace, and the remainder flowing around the end of the partition wall and passing into the regenerator through its duct, mixing on its way with live gas derived from the gas-flue, and passing into the regenerator chamber—the flame so produced serving to reheat the cooled regenerator.

Gas Pressure-Reducing Valves.

SOCIÉTÉ ANONYME D'APPLICATIONS DES GAZ LIQUÉFIÉS, of Paris.

No. 2513; Jan. 30, 1914. Convention date, March 8, 1913.

This pressure-reducing apparatus for gases is of the kind in which a valve controlling the inlet to the valve-casing is closed, through the medium of a lever, by an increase of pressure in the casing displacing a diaphragm or equivalent device, and in which the valve casing is also provided with an automatic safety valve intended to be operated by the direct action on it of an undue increase of pressure in the casing—due, for instance, to faulty operation of the inlet valve.



A French Gas Pressure-Reducing Valve.

Fig. 1 represents the known type of reducing valve. Here, when pressure increases in the casing, the spring A is compressed and the lever B, displaced by the spring C, follows the diaphragm, and the plug D shuts the gas inlet. It may, however, happen that the plug will not shut properly—either because something gets between it and its seat or because the material of which it is made is cracked; and so there is continual communication between the two spaces, and the object in view is not obtained. Consequently all the reducing valves are provided with (in addition to a pressure regulator) a safety valve E pressed on its seat—part of the valve casing—by a spring the pressure of which is regulated by a screw in such a manner that the valve is displaced from its seat when the pressure in the valve casing becomes too great.

Apparently this gives absolute security, but such is not the case for two reasons: 1. To be fluid-tight the safety-valve must be made of a plastic substance, usually rubber, which may finally adhere to the valve-seat, especially when the valve is not worked for a long time. The valve, adjusted for a certain pressure, will not then move except under a much greater pressure. 2. Reducing valves are often entrusted to persons who do not trouble to ascertain whether they are in order.

The present invention relates to a reducing valve without these two inconveniences. The member operating the plug—*e.g.*, a lever—can (when the plug has been applied and held against its seat) nevertheless continue the movement which the diaphragm tends to give it when the pressure in the reducing valve casing continues to increase. To permit this, instead of acting rigidly on the plug, the lever acts yieldingly, either by itself forming a spring or by the intervention of a spring at a suitable point. When the plug impinges against its seat, the yielding action of the lever permits it to continue its movement if influenced to move. In this supplemental displacement, the lever, at one of its points, comes into contact with a stud attached to the safety valve, upon which it acts for opening it, in the same way as the interior pressure.

Fig. 2 represents a reducing valve similar to fig. 1, furnished with the device now invented. The spring C in fig. 1 is suppressed; and the lever is made interdependent with the diaphragm by a stem F secured to the diaphragm, and to which it is pivotally connected and can slide easily.

Yielding of the operative element is here realized as follows: The plug is not fixed directly on the lever B, but on a plate spring G attached to the lever, and of which the bending can be regulated by a screw. The safety valve comprises the same parts as in fig. 1; but it is arranged so that it can be worked by the member operating the plug, when, owing to its yielding connection, this member continues its motion after the plug has reached the closed position. For this purpose there is a rod H on the valve which works normally like that of fig. 1. When the pressure for which it is adjusted is attained, the plug D comes into contact with its seat, and should cut off the gas; the bend previously given to the spring G by the screw being estimated

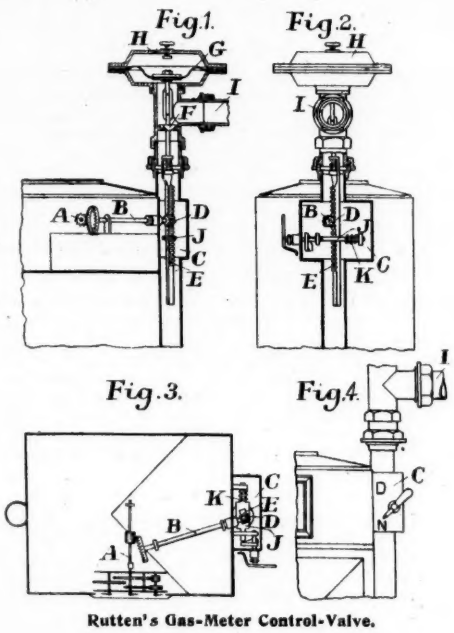
to give this result. If, however, for any reason the closure is not complete, the pressure continues to increase in the valve casing; the lever drawn by the diaphragm continues its movement, which allows further bending of the plate spring, and the extremity I of this lever impinges upon the safety valve rod H, which it raises off its seat when, through adhesion or bad adjustment, it has not risen by itself.

Meter-Controlling Gas-Valves.

RUTTEN, J., of the Hague, Holland.

No. 3432; Feb. 10, 1914.

This is an improvement in the apparatus described in patent No. 2892 of 1911—more particularly with the object of providing a simpler and cheaper form of apparatus, by the replacement of the two valves mentioned in the earlier specification by a single valve, which is also adapted to act as a safety valve.



Rutten's Gas-Meter Control-Valve.

Fig. 1 is a vertical section of the apparatus with the adjacent portion of a gas-meter; fig. 2 is a vertical section; fig. 3 is a horizontal section taken through the upper part of the meter; and fig. 4 is a side elevation of fig. 1.

The shaft A, which drives the counting mechanism of the meter, also drives the shaft B through tooth-wheeled gearing. This latter shaft extends through a gas-tight joint in the wall of the meter. On the end of the shaft B, projecting into the enlarged portion C of the gas-passage for supplying the service pipe, there is mounted a toothed wheel capable of engaging a vertical rack E, which hangs, through the medium of a spring, from the depending stem of a valve F (formed with a shallow groove) connected by a chain link to the diaphragm G arranged in the casing H. In the cover of the casing is a set screw for limiting the upward movement of the diaphragm.

The service pipe I branches off from a point between the diaphragm and the valve F.

The rack E can be moved into and out of engagement with the toothed wheel D by the following means: The rack is readily slidable through a plate J, which is able to move between guides. The spring K has a constant tendency to move the plate towards the left (fig. 2), in which position the rack is in engagement with the toothed wheel D. But it can be moved in opposition to the action of the spring by means of a handle connected to a pin which extends through a gas-tight joint in the wall of the enlarged portion C of the gas-passage supplying the service-pipe. This pin is provided with a lateral tappet J; so that, by operating the handle, the tappet can be caused to strike the end of the plate, and thus force it back.

The operation of the apparatus is as follows: If the handle is placed in the "night position," the spring K will move the plate J so that the rack E will engage the toothed wheel D on the shaft B. The shaft A, driving the counting mechanism of the meter, now drives also the wheel D through the medium of the shaft B, whereby the rack is gradually moved down until the valve F has reached its seat. The flow of gas through the service pipe is now shut off with the exception of the passage formed by the groove in the valve. Consequently, when the handle is placed into the "night position," only a determined quantity of gas can pass through the service pipe, and will continue to pass until the driving mechanism of the meter shall have moved the valve F on to its seat. If next morning the handle be moved into the "day position," the plate J will be pushed back by the tappet, thereby moving the rack out of engagement from the toothed wheel D. If, now, one or more service cocks are open, then only a small quantity of gas can leak through the groove of the valve into the service pipe, and thence escape through the open cocks. The quantity of escaping gas is, however, too small to constitute a danger. But if all the service-cocks are closed, the gas leaking through the groove will raise the pressure under the diaphragm G, thus lifting the latter and with it the valve F. A full supply of gas will then pass into the service pipe for use in the usual way.

Treating Gas Liquor in Small Gas-Works.

BERLIN-ANHALTISCHE MASCHINENBAU-ACTIEN-GESELLSCHAFT, of Berlin.

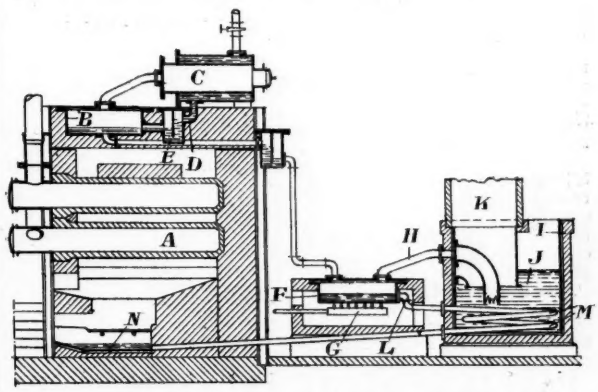
No. 4242; Feb. 18, 1914. Convention date, May 9, 1913.

According to this process the crude gas liquor is first passed into evaporating vessels connected up singly or in sets in the top course of the brickwork of the retort-furnaces; and the heat of the furnaces causes a part of the volatile ammonia present in the crude liquor to evaporate. The volatile ammonia driven off, which is mainly combined with carbonic acid, is conducted into a cooled iron vessel through as short a system of pipes as possible having slight bends, and the distillates condense in this iron vessel as solid ammonium carbonate. The advantage of employing the heat of the furnaces for evaporating the volatile ammonia in the crude liquor is said to be that this heat costs nothing; but, on the other hand, the temperature in the upper part of the retort-furnaces is so low that with the correct adjustment of the inflowing liquor little crude liquor evaporates, and only part of the volatile ammonia in the crude liquor is driven off.

The ammoniacal liquor is passed from the evaporating vessels over the furnaces through pipes into a second evaporating vessel (heated by gas or in some other manner) erected by the side of, or behind, the furnaces. In this second vessel the rest of the volatile ammonia is driven off from the crude liquor, and is thence conducted into a saturator through as short a system of pipes as possible having slight bends and necessitating no choking-up; the saturator being charged with dilute sulphuric acid. The ammonia gases are led into the acid through a pipe having its mouth below the surface of the acid, and pass right through the acid bath—being finely divided by the scalloped end of the pipe. The ammonia that is driven off in the evaporating vessel erected by the side of, or behind, the furnaces, is converted into ammonium sulphate; while the remaining gases escape through a flue.

The ammoniacal liquor that is treated in the second evaporating vessel first flows through a coil of piping arranged in the saturator, whereby it gives off a great part of its heat to the acid bath and so prevents the formation of lye in the saturator—that is to say, the formation of a mixture of ammonia, sulphuric acid, and water by reason of the dilution of the sulphuric acid by water carried over with the ammonia driven off in the second evaporating vessel. The heat given to the bath serves to drive off the excess of water. The ammoniacal liquor can then be brought into vats in the retort-furnaces to be evaporated under the grate.

From time to time, the ammonia salt obtained in the condenser on the furnace is shovelled out and placed in the acid bath, in order to convert this also into ammonium sulphate. When the acid bath has been completely saturated, and the ammonia separated out in the saturator as sulphate of ammonia, it is scooped out and dried.



A "Bamag" Liquor Plant for Small Gas-Works.

In the top course of the setting for the retorts A, the evaporating vessel B is arranged—fitted with a gas-tight lid. The volatile ammonium compounds driven off from the crude liquor by heat, pass into the condenser C, which is enclosed in a jacket into which cooling liquid flows in a regulated stream. This cooling liquid, which is the crude ammoniacal liquor from which the ammonia is to be driven, flows through a pipe D (after it has passed through the cooling jacket) attached to the supports of the condenser. It then passes through a water seal E, and thence into the evaporating vessel B. The flow of ammoniacal liquor into the vessel is so regulated that the temperature in it remains at 80° to 90° C. When the plant begins to work, the vessel is filled with crude liquor, and then the inlet pipe is kept closed until the temperature in the evaporating vessel has reached about 90° C. The inflow is then adjusted.

The ammoniacal liquor that has been partially evaporated in B is conducted to the vessel F through a pipe fitted with a water-seal and a gas-tight lid. The heat necessary for driving off the remaining part of the volatile ammonia gases from the crude liquor that has already been treated by evaporation in B is produced by the gas-burner G. The ammonia gases driven off in the vessel F escape through a short pipe H, having slight bends, and connected to the lid of the evaporating vessel F and saturator I.

Within the saturator, at the point of entry of the pipe H, a bent pipe is disposed which serves to conduct the ammonia gas into the acid-bath. The lower end of the pipe is scalloped, whereby the current of ammonia gas in the acid bath J is finely divided. For receiving the exhaust gases there is disposed within the saturator I a hood, which conducts the exhaust gases into a flue K.

After the volatile ammonia gases have been completely driven off in the vessel F, the ammoniacal liquor flows out through the pipe L to a

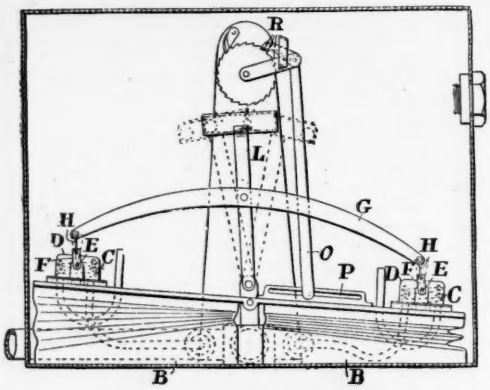
coil M, through which the liquor gives its heat to the acid-bath in order to prevent the formation of lye. After passing through the coil the liquor flows into the vat N of the retort-furnace, where it evaporates under the grate.

Gas-Meters.

JACKSON, T., of New Cross, S.E., and RAMSAY, A., of Folkestone.

No. 5874; March 7, 1914.

This invention is an improvement on patent No. 7851 of 1913, and has for its object "the construction and arrangement of such a device whereby greater facilities of adjustment are afforded, and simplicity of manufacture and assembling of parts are obtained."



Jackson and Ramsay's Gas-Meter.

A sectional view is given of a meter case containing the improved mechanism.

The meter case and expansible chambers B are like those described in the earlier specification; but in this case the control of the valves C is effected by a gravity controlled device outside the valve boxes D. The valves rock about an axis and are operated by a spindle E (passing to the outside of the valve boxes) attached to an arm F, pivotally attached to one end of a connecting bar G, preferably by a spring element H, so as to set up a certain amount of resiliency between the parts connected. Pivoted either on a support fixedly mounted on the casing or equivalently on the movable part of the chambers B is a lever L, connected to the bar G (and carrying a weight at its upper end) adapted to pass a point of unstable equilibrium from side to side, so that after this point has been passed the action of gravity on the weight will continue the movement of the bar.

The weight is shown in the position at which it has arrived from one terminal position shown in dotted lines on the left, just before it reaches the point of unstable equilibrium, which, when passed, will enable gravity to carry the lever L into the right-hand dotted position, so as to open and close the valves C on each chamber, and so fulfil the known function described in the 1913 specification.

When the weight arrives at either terminal dotted position, a shock is liable to be created by the valves coming on their seat suddenly; and to avoid this, and to insure absolute closure of the two valves on each chamber B, the spring H (or other equivalent resilient element) is provided in the train of operating mechanism. The number of operations of the chamber B is recorded in known manner by a connecting rod O, adjustable on its lower end as to its point of pivoting, by means of a slot P, the upper end operating the counting mechanism by ratchets R in the manner well understood.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Bills Royal Assented.

The following Bills received the Royal Assent last Friday:—

Gas Provisional Order (No. 2).
Gas Provisional Orders (No. 3).
Gas Light and Coke Company.
Leighton Buzzard Gas.
Edenbridge and District Gas.
Skegness Urban District Gouncil.
Manchester Corporation.
West Gloucestershire Water.
Northwich Urban District Council.
Riddings District Gas.
Southend Gas.
Wadhurst and District Gas.
Hayward's Heath Gas.
Ossett Corporation.
Walsall Corporation.
St. Anne's-on-Sea Improvement.
Porthcawl Urban District Council.
Weston-super-Mare Urban District Council.
City of London (Various Powers).
Isle of Thanet Gas.

The Edinburgh and District Water Order Confirmation Bill, the Kirkcaldy Corporation Order Confirmation Bill, and the Sheffield Corporation Bill were read the third time and passed.

The London County Council (General Powers) Bill has been suspended till next session.

MISCELLANEOUS NEWS.

THE GAS LIGHT AND COKE COMPANY.

The Half-Yearly Ordinary General Meeting of Proprietors was held on Friday, at the Chief Offices, Horseferry Road, S.W.—Sir CORBET WOODALL, D.Sc., M.Inst. C.E. (the Governor), in the chair.

The SECRETARY (Mr. Henry Rayner) read the notice convening the meeting; and the seal of the Company having been affixed to the Register of Proprietors, the report and accounts were taken as read.

The GOVERNOR: Ladies and gentlemen, it is my duty to move that the report be received and adopted. I regret to say that I am under orders carefully to avoid anything in the way of public speaking, so, with your permission, I will ask the General Manager to read the observations I desire to address to you.

THE GOVERNOR'S STATEMENT.

The GENERAL MANAGER (Mr. D. Milne Watson) read the Governor's speech as follows: We meet to-day under national conditions so grave, so unexampled, and amidst circumstances so unexpected, as to warrant my claiming your sympathy when I confess to a great difficulty in concentrating my observations upon the mere details of the business which brings us together. While there is so much of an extraordinary nature challenging our attention, not only as persons responsible for the financial issues of an enormous undertaking, but also as Englishmen and employers of many workers, the simple annals of the Company's proceedings during the half year may well seem tame, even tiresome.

THE COUNTRY'S CALL.

Let me say at once, with regard to those of our employees who have responded to the country's call to arms, that the Directors will, as on previous occasions, so far as lies in their power, give aid and comfort to them and to those dependent upon them. [Loud cheers.] We have always encouraged the Territorial Force, and we shall not fail in acting up to the full to our consequent obligations in this regard. ["Hear, hear."] Notwithstanding what I have said, it remains our duty to give undiminished attention to the affairs of the Company; and I will, before asking you to adopt the report, make a few observations on the accounts.

THE ACCOUNTS.

As anticipated in the remarks I addressed to you six months ago, we have again to draw upon our undivided balance in order to pay the dividend we recommend. It is consolatory to know, however, that the supplemental amount required is less than we then estimated. The reduction in the carry-forward which we reported in February was £96,000, and I then said: "We can hardly hope to make a less heavy call upon our surplus funds at the end of the current half year. It will probably be greater." The actual figure is £79,000. This is satisfactory, so far as it goes; but each such inroad brings us nearer to the limit beyond which the depletion of our reserves cannot be carried with safety.

An examination of some details of the accounts will help us to a conclusion as to what our position is. I make no apology for again referring to the state of the Company's capital account, or for putting it into the forefront. In the half year under consideration, we have spent on new plant and apparatus £57,265; and this has been correctly charged as an addition to capital. At the same time, the whole plant is undergoing waste and depreciation, calling for renewals and reconstructions. For instance, since we last met, one of the gasholders at Bow Common, built in the year 1850, has been adjudged unfit for further use. It has been scrapped, and will have to be replaced elsewhere. Its book value was £9500. At Stratford, also, a considerable plant for the manufacture of sulphate of ammonia has been dismantled; the ammoniacal liquor being sent through a pipe-line to the chemical works at Beckton, where the manufacture can be carried on much more economically. In both these cases, the book value of the plant has been charged against revenue. Otherwise the capital would bear the cost twice over. These are illustrations of what is constantly happening. It is not difficult to show large profits for a time by deferring indefinitely the liquidation of such obligations; but the result is an inflated capital, which eventually becomes ruinous.

Following the path indicated, we have written-off £81,420 in the last half year, leaving the balance of working capital £24,000 greater than it was at Christmas. Four-and-a-half years ago—in December, 1909—this balance amounted to £389,366; to-day, it is £382,815—practically the same sum. Within the four-and-a-half years, our output of gas has increased by 11 per cent.—about equal to the total consumption in the great city of Leeds. We have added 167,000 to the number of fires and stoves in use, and have fitted the premises of more than 100,000 consumers with prepayment meters and fittings, while the charge for capital has been actually reduced. Needless to say how much the financial strength of the Company is thus improved. I am able to confirm the reports of the Engineers that the whole of the works and plant are maintained in a state of the highest efficiency. The charge for capital per 1000 cubic feet in the accounts before you is the lowest in the history of the Company. The balance of unspent capital (£382,815) is not nearly sufficient for working purposes. We need a full million; and for this purpose the accumulation of undivided profit is peculiarly valuable. After the payment of the dividend now recommended, there will remain £535,000 on this account. We have other considerable funds, the details of which you will see in the balance-sheet, which are available for working capital. Part of these are the property of the officers and workmen, which we employ, paying interest therefor. Estimates made under the present circumstances of the country are of little (if any) value. Otherwise I should have said that we can afford to reduce our liquid assets by a quarter-of-a-million before contemplating an increase in the price of gas. Turning to the revenue account, I can say that the working results have been good—

generally speaking better than ever before. The deficiency of profit has been due to circumstances which are abnormal, beyond the control of the management, and such as will inevitably abate or disappear in due time.

THE PRICE OF COAL.

During the whole of the half year, we have paid a very high price for coal; and for the first time in my experience dear coal has brought no compensation in the value of coke. On the contrary, the market price of this product has fallen seriously. For the year to June 30 last, the gross cost of coal purchased was 4s. 4d. per ton in excess of the price paid in 1912. This represents more than £400,000. Improvements in the receipts for residuals produced £40,000; so that the net loss on the comparison was about £360,000. I am glad to say that the coal purchases recently completed have been at more reasonable prices. They show an average reduction of a little over 2s. per ton. For the current half year, because of the large stocks held on June 30 which have to be brought into account at last year's price, as also the balance of contracts which have yet to be received, the difference will not equal quite 11d. per ton. Only when the commercial prosperity of the country is declining has relief come to us in the price of coal. Dear coal has doubtless hastened the decline. Before the emergency which has so swiftly overtaken the country, there were some suggestions to the employers and on the part of workmen at the pits for united action to keep up prices—generally in the direction of limiting the output. One can but feel that anything of this kind has been put out of date by present circumstances. Besides, the influence of the bad trade conditions to which the world is apparently condemned must be fatal to any selfish policy conceived in the supposed interest of a few. In this connection, I desire to cordially recognize the spirit of Sir A. Markham's declaration in the House of Commons on Monday last, that he had given instructions forbidding any raising of the price of coal by the important group of mines under his control. Patriotism is much on our lips just now. It is well to recognize that care for our country can be shown in more ways than the supreme one of fighting for her. This declaration of Sir A. Markham is an instance.

FURTHER FIGURES.

Although the sale of gas has increased by nearly 2 per cent., the quantity of coal carbonized during the half year was less by 100,000 tons. Of this decrease, 11,285 tons resulted from a further increase in the make of gas per ton, and the remainder from the replacing of coal by oil. The increase in cost represented a sum of £64,740, the decrease in quantity £77,913; so that our actual payment for coal was less by £13,173. Against this, oil cost £43,147 more, of which increase in quantity represented £21,022, and higher price £22,125. Chiefly due to improved working, but also to the substitution of oil for coal, there was a saving of £14,356 in wages. The revenue from gas, with meter and other rents, shows an increase of £41,943. On the other hand, residuals have yielded less by £107,672, of which the lower price received accounts for £46,854, and less coal carbonized (and consequently less residuals made), £60,818. One interesting item in the accounts is that of bad debts. These are reduced by £1436, and, like the cost of the dividend, form a record in the story of the Company. The great fall in the price of coke has been due to several causes: (1) To the quantities manufactured at the collieries in improved ovens, (2) the increased make owing to the giving up, in many places, of the manufacture of oil gas by reason of the late high prices of oil, and (3) the reduced demand for cement making. The market price has also been brought down by unwise competition for orders—competition which has added nothing to the quantity sold, while greatly reducing the revenue of the gas companies. This has now been realized, and measures taken to prevent the price falling as it has done lately far below its fuel value. Efforts are also being made to bring more intimately to the knowledge of the public the value of coke for domestic use.

DIVISIBLE PROFIT.

The profit of the half year, after providing for redemption fund, is £319,477. Adding the sum brought forward from the previous half year, there is a total available balance of £933,530. After paying the dividend of £4 17s. 4d. there will, as I have already said, remain £535,314 at the credit of the current half year.

CO-PARTNERSHIP.

It is a pleasure to report that co-partnership continues to prosper, helping in the formation and maintenance of cordial relations with and between all classes of the Company's employees. The amount now standing to the credit of co-partners is £217,718, of which £114,636 is invested in stock.

FORFEITURES.

The Directors are sorry that the Government Auditor's certificate to the accounts is accompanied by a reference to forfeitures amounting to £52. That every effort is made to maintain the illuminating efficiency of the Company's gas has been urged from this chair again and again. But occasionally the same gas which is certified by quite a number of testers as of statutory quality fails, for reasons beyond our ken, to pass the test of one solitary examiner; and a fine results. It is with much satisfaction we are able to report that the Company's Act of this session now only awaits the Royal Assent. With the disappearance at the close of this year of the inexact illuminating power test, and the advent of the far more exact calorific test, it is hoped that forfeitures, never very frequent, may become almost unknown.

EMPLOYEES CALLED UP.

I omitted to mention at the beginning of these remarks that, as a result of the mobilization of His Majesty's forces, upwards of 1000 of the Company's employees on the reserve and territorial lists have been called upon to take their places among the defenders of their country. I am sure that our earnest good wishes go with them, and will remain with them. I am equally sure that you will approve the steps which the Directors have taken to secure wives and children against privation while the bread-winners are serving with the Colours. [Applause.] I have pleasure in moving:

> "That this meeting do agree with, and confirm, the report of the Directors and the Auditors' report and statement of the accounts of the Company as transmitted to the proprietors on the 30th ult."

Before putting the resolution to the meeting, I shall be happy to hear any remarks which proprietors may wish to make, and to endeavour to answer any questions they may ask.

The DEPUTY-GOVERNOR (Mr. John Miles): I beg to second that motion.

REMARKS BY SHAREHOLDERS.

Mr. A. BEVIS thought it would be a great pity if, at a meeting like this, notwithstanding the circumstances of the war crisis, no shareholder wished to make a remark. He was present at the meeting six months ago when no proprietor rose; but he thought it was their duty, especially at a time when the Governor was not in good health, to consider what had been done by him. Sir Corbet Woodall (then Mr. Corbet Woodall) became a Director in 1897, and was elected Governor in February, 1906. In reference, however, to any benefit to the Company attributed in these few remarks to Sir Corbet Woodall as Governor, everyone knew that he (Sir Corbet) would readily give full credit to the other members of the Board, also to the staff and the workmen, from the highest to the lowest, for all the assistance they had rendered him. Now first a word about the size of the Company. When Mr. John Orwell Phillips entered its service as Secretary in 1862, it was by no means the largest Gas Company in London; but by carrying through a series of amalgamations, he raised this, the first Gas Company, to be also the largest Gas Company in the world. Its size at the time that Sir Corbet Woodall accepted the governorship might perhaps best be realized by stating that it was manufacturing fully one-eighth of the gas supplied to the whole kingdom of Great Britain. He (Mr. Bevis) would now mention some of the chief items of improvement since that time. The price of gas had been reduced by 5d. per 1000 cubic feet—equal on the present sale of gas, after allowing for the re-instatement of ordinary meter-rents, to about £500,000 per annum; the dividend had been raised from £4 8s. to £4 17s. 4d. per cent.—an increase of £76,000 a year; and the capital account had been materially improved in relation to the business done. The next point was the insurance fund (or, as it was now called, the special purposes fund) which had been raised from £86,000 to £298,000—an increase of £212,000. Then the co-partnership system had been introduced, and the bonuses already distributed amounted to £228,000. Lastly the sum carried forward after providing for dividend, notwithstanding it had been drawn upon in recent half years, still stood at the substantial figure of £535,000, which was £354,000 more than at the commencement of the period dealt with. One other interesting way of looking at the figures was this: The Governor was a strong believer in the tripartite system; and in this connection the consumers, who were by far the most numerous of the three classes, were benefiting to the extent of £500,000 a year; the shareholders, the next largest class, to the extent of £76,000 per annum; and the employees, as shown by the printed accounts, had a bonus for the past year of £45,000. These annual items made a total of £621,000 distributed between the three great parties who were directly interested in the management of the undertaking; and the whole of these benefits had accrued since the commencement of Sir Corbet Woodall's governorship about years ago.

Mr. ARTHUR POTTER asked how their results compared with those of the Brentford and the South Metropolitan Companies. He was only a very small holder; but his relations held many shares, and they all thought the results should be much better than they were. A great many people said the Company's methods were out of date; and he thought that if they could not get better results they should look into the management. The South Metropolitan Company were the most up-to-date gas company in the world. They showed much better results; and he suggested that the Board should compare the two results and then look into the methods of that Company. [Cries of dissent.]

Mr. C. E. JONES said he first of all desired to voice the regret of himself and friends at the indisposition of their valued Governor. He hoped it was only temporary, and they all wished his recovery to full vigour with all the rapidity possible. It was interesting to hear that considerable benefits had been conferred upon the three great parties connected with the Company; and he thought it was an undoubted fact that the balance-sheet presented was of a very satisfactory character. [Hear, hear.] All those who had experience of trade knew that gas companies, like all other undertakings, were subject to vicissitudes of trade; and every thousand pounds spent in a district by a gas company benefited that company more or less. This Company had passed through a very hard time; and it should not be forgotten that it was the oldest company in the world, and had been tutor to all the gas companies on the face of the globe. It was quite true that in the past the Company had been somewhat over-capitalized; but all this had been altered—the capital had been reduced, the results obtained by carbonization had been immensely increased, and everything pointed to the fact that if they only had faith in the Board they would have successful management of their affairs in the future. [Cheers.] He did not agree with the observations of the last speaker. They had the management before them in the shape of the balance-sheet; and, instead of desiring any more information he, knowing something about the inner working of gas companies, congratulated the Board upon the report presented and the results obtained, and he congratulated the proprietors upon getting such excellent results. [Hear, hear.]

REPLY BY THE GOVERNOR.

The GOVERNOR: If no further observations are to be made, I will try to reply to those already made. In the first place, I was quite unaware that my friend Mr. Bevis was going to make personal references to the Governor of the Company. It is quite true that my health has not been very good lately; but I hardly expected a notice that would make a very good obituary one if my attendances here had come to an end. With regard to the observations of the second speaker, I am at a loss to understand what has brought

him here to-day. If he wanted information with regard to the Company in any detail, he should have interviewed either the Accountant or the General Manager, from whom he would have got all the information he desired, and he would not have been in the foolish position of having made statements altogether contrary to facts. It is not our custom here—and I hope it never will be—to make invidious comparisons between our Company and any other company. If, in the search for information, the shareholder wishes to learn more about the Brentford and the South Metropolitan Companies, he need only apply to them, and they will, I am sure, give him all the information desired; and then, having that information, we shall welcome him when he comes here with any instructive comparisons. I am quite sure, however, that any comparisons will not be to the disparagement of the Gas Light and Coke Company. I do not think I have anything to add to the observations the General Manager has read, except to say that we are thoroughly satisfied with the position of the Company from all practical points of view. As I have already said, the works are maintained in a condition of the very highest efficiency, and all the manufacturing results are among the best to be met with. With regard to the future, we, like everybody else, are full of anxiety as to what the next half year, or even the next few weeks, will bring forth. But there is one thing of which I am quite sure, judging by the evidence I already have—for instance, the officers foregoing their holidays, for which full arrangements had been made, and stopping to work until matters are in a more comfortable position—and that is that, from the highest to the lowest, everybody is working with the heartiest and most cheerful disposition to make the best of the trying circumstances through which we are passing.

The resolution was put and carried unanimously.

The Dividend.

The Governor: I will now ask the Secretary to read the resolution with regard to the dividend.

The Secretary read from the Directors' minutes the following:—

> Resolved: That it be recommended to the half-yearly ordinary general meeting of proprietors to be held on the 7th prox.—
>
> (1) That dividends as follows for the half year ending the 30th June last be declared—viz.:
>
> On the 4 per cent. consolidated preference stock at the rate of £4 per cent. per annum;
>
> On the 3½ per cent. maximum stock at the rate of £3 10s. per cent. per annum;
>
> subject to deduction of income-tax.
>
> (2) That, out of the divisible profits for the said half year remaining after the payment of the foregoing dividends, the sum of £15,000 be set aside towards the redemption fund, in accordance with the provisions of the Company's Act of 1903.
>
> (3) That, out of the balance of divisible profits, amounting to £933,530 4s. 2d., and applicable to dividend on the ordinary stock, the sum of £398,216 2s. 10d. be set apart for the payment of dividend for the said half year on the ordinary stock of the Company, and that such sum be appropriated in payment to the proprietors of ordinary stock of a dividend for the said half year at the rate of £4 17s. 4d. per cent. per annum, subject to deduction of income-tax, and in payment of forfeitures incurred during the half year amounting to £52.

The Governor, in moving the resolution, said: If this meeting had been held a week earlier, I should have almost certainly asked you to leave yourselves in the hands of the Board as to the date when the dividends would be paid. I am glad to say that the alteration which has taken place in the financial situation within the last day or two has enabled us to promise that the dividends will be paid as usual on the 1st of September next. It has been a time of grave anxiety; but the bankers have done their best to assist us, and the money will be forthcoming.

The Deputy-Governor seconded the motion, which was put and carried unanimously.

Sale of Land.

On the motion of the Governor, seconded by the Deputy Governor, a resolution was unanimously passed authorizing the Company to dispose of certain portions of their property not now required for the purposes of the undertaking.

The Governor: To one small matter I am asked by the officers to call your attention. You may have noticed that the wrapper in which you received your half-yearly report and accounts was, for the first time, addressed by mechanical process. The same process is being adopted in the preparation and distribution of your dividend warrants. Should any proprietor have the curiosity to compare the old form of warrant with the new, and note the abbreviated style of the latter, I will ask him to accept my assurance that the difference is due to the limitations of the mechanical process, and not to any lack of courtesy on the part of the official staff. That completes the business of the day.

Votes of Thanks.

Mr. William King said there was one resolution he wished to submit to the meeting, and which he was sure would meet with their very hearty acceptance—namely, "That the best thanks of the proprietors be given to Sir Corbet Woodall, the Governor, and the members of the Board for their services to the Company during the past half year;" and, in addition, he wished that a hearty vote of thanks might be given also to the officers, officials, and all the workmen who had contributed to getting out the satisfactory results which had been laid before them. Sometimes circumstances were too strong for any man or directors; and he thought, considering the circumstances they had passed through, the results were as satisfactory as even the most exacting proprietor could expect. He was sorry the Governor was suffering from indisposition; his services to the Company were so great and valuable that he hoped the anxiety of the present crisis would not seriously impair Sir Corbet Woodall's health, and that in a short time the Governor would be able to give them one of his personal addresses which were so much more interesting than a written statement. He knew that they could not have such excellent results without a good Board of Directors. No doubt there was an infinite amount of work involved in getting out the figures of the accounts and giving the concentrated results in the balance-sheet; and this proved that they had a staff of extremely capable men. With regard to the workmen, it was by their care and assiduity that these results were obtained. He knew that a little carelessness on the part of a workman might involve the Company in serious loss; and it was very remarkable, when one looked at the amount of their business, how free they were from damage of all sorts. Good feeling must exist from the Governor to the smallest boy, and they were all aiming to get the result which gave the proprietors their dividends. He was sure their best thanks were due to one and all. They were meeting under very extraordinary circumstances—one could not walk along Whitehall without seeing that—and it was a matter for rejoicing to know that some of their workmen had gone to the war, or were prepared to go if necessary. The proprietors greatly rejoiced to learn that the Board had already made arrangements that the dependants of those gone to serve their country should be cared for. [Hear, hear.] Personally, he was sure that if it entailed some little sacrifice on their part in the way of dividend they were prepared to make it to look after the wives and families of those gone to fight for the honour of the country. He begged to offer his very hearty thanks to the Board and the staff for what they had accomplished. He knew they had had to contend with very difficult circumstances during the past half year, and he thought they had done thoroughly well. As a proprietor, he begged to express his satisfaction with what had been done, and he tendered to the Board his best thanks.

Mr. W. A. Hounsom wished to have the pleasure of seconding the motion. It had been his lot on several occasions either to move or to second a resolution to the same effect as this very inclusive resolution. He endorsed the sentiments so well expressed by the previous speaker; and he said, with very long experience of these meetings even before the amalgamations took place, that there was a tone in the meeting of sympathy and solidarity, small though the meeting was in number, that he never recollected before. He believed that this sympathy and this solidarity would be a great comfort not only to the Board but to all associated with the Company in days to come.

The resolution was put and carried with cheers.

The Governor: I wish I were able to acknowledge as I should like to do the extremely friendly and cordial words which have been addressed to the Board. Never before in my experience have I appreciated so much that solidarity of sympathy which Mr. Hounsom has so well expressed, and which has been so evident. We are full of anxiety—I cannot disguise it—about certain aspects of our work in the immediate future. Again following the line of the resolution, we have such absolute confidence in the men of all classes, from the General Manager downwards, that they will do all that men can do to overcome difficulties that arise, that we face them with, at any rate, a cheerful mind, and we will try with cheerful faces. I thank you very much indeed for your vote.

Mr. D. Milne Watson (General Manager) said he would like to say a few words to thank the Governor, Mr. King, and Mr. Hounsom for the very kind words they had said about the staff and the workmen. Speaking on their behalf, he said they had gone through a period of strenuous work; but they looked forward with great confidence to a period of still more strenuous work. There was no disguising the fact that difficulties were in front of them; but he assured the proprietors that the staff would do everything in their power to meet and overcome all difficulties in the future as they had met them in the past. Those who had got to stay at home would endeavour to take the places of their comrades, and to do the work of those who were serving their country; and in so doing he thought they would be rendering the best services to the Company and the country.

The Governor: Before we separate, I may tell you that while this meeting has been proceeding a message has come to us as to our steamship *Fulgens*, which we launched only two years ago. She has been doing good service; but she has been held up for a few days in the Tyne, and we now have a message from the Government asking us, after her discharge, to transfer her to the public service for use in connection with the unhappy war. We have already contributed a considerable number of motor cars and trolleys to that service, and also a number of very excellent horses.

The proceedings then terminated.

WANGANUI (N.Z.) MUNICIPAL GAS UNDERTAKING.

Manager's Annual Report.

The report of the Gas Engineer and Manager of the Wanganui (N.Z.) Corporation, Mr. G. D. Stone, for the year ended the 31st of March last, which has just come to hand, shows that, from a financial standpoint, the period covered was a good one. The increase in the output of gas was not so marked as in the preceding eight years (being only about 8½ per cent.) owing to the mild, open winter and the bright and dry weather during the summer. The gross profit amounted to £12,633, of which £4605 was taken for interest and the sinking fund, £1916 for payment for plant, £720 the cost of the public lighting over the amount received, and £2000 was placed to the general account to assist the rates. Allowing for reductions on coke for the trams and on tar to the borough (together £219), there was left a surplus of £3073. The increase in the sales of gas produced £1600; those for coke and tar bringing up the total to £2269. The average make of gas was 14,804 cubic feet per ton of coal used; being 283 cubic feet more than the best previous year's average. The number of new meters connected was 258, and of gas cookers sold and connected 88. This Mr. Stone considers small in view of the size of the district served and the low cost of gas compared with other fuel. There is room, he says, for another 1000 cookers; and he recommends the setting aside of £300 per annum for their supply on the free and deferred payment systems, the sale of gas-fires at actual cost or under, and giving advice to consumers in regard to the economical use of these appliances. The length of mains laid during the year was 28,866 feet, and of service-pipes 7740 feet. The plant was extended by the installation of two 25-feet purifiers, an exhauster with a capacity of 50,000 cubic feet per hour, and compressing plant equal to 40,000 cubic feet per hour. With regard to the vertical retorts which are being installed, Mr. Stone says they are not large enough to meet all the requirements. The rest of the gas will consequently have to be made in the horizontal retorts.

BRENTFORD GAS COMPANY.

The Half-Yearly Meeting of the Company was held last Friday, at St. Ermin's Hotel, Caxton Street, S.W.—Mr. REGINALD J. NEVILLE NEVILLE, M.P., in the chair.

The SECRETARY (Mr. John T. Croxford) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

DIVIDEND MORE THAN EARNED, DESPITE ADVERSE CIRCUMSTANCES.

The CHAIRMAN, in moving the adoption of the report and accounts, said the latter were, on the whole, extremely satisfactory; and it was gratifying to note that, notwithstanding the serious falling-off in the value of residuals, from which all gas companies had had to suffer, as well as the reduction which was made in the price of gas, the dividend had been earned, with £5000 odd to spare. Comparing the present statement with that of the corresponding period of last year, it would be seen that the two items he had mentioned alone accounted for a difference of about £16,000—residuals showing £11,943 less; and the reduction of 1d. per 1000 cubic feet in the price of gas representing some £4200. Taking the revenue account in detail, coal and oil had cost £7623 more, or an increase of 7·3 per cent. But as the gas sold produced an increase of 7·42 per cent., the balance was on the right side. He did not think it was necessary for him to go through all the various items in the accounts; there being really nothing to call for particular notice.

EXPANSION OF THE HEATING CONNECTIONS.

The proprietors would be glad to know that the Company had now on hire more than 100,000 stoves, fires, and other heating appliances; and as they had 108,000 consumers, it would be seen that 90 per cent. of them used gas-stoves and other heating appliances. From this, it would be understood that their business had been pretty well pushed in the district. Rates and taxes had, of course, gone up, which was something he was afraid they must expect.

THE NEW WESTERN ROAD.

Another higher item was parliamentary charges; this being due to their own Bill in Parliament, and to the strenuous opposition they were bound to make, in the interests of the Company, against the Middlesex County Council. The Council were proposing to construct a beautiful road, which everybody knew was for the relief of the traffic to the west of London. In connection with it, the Council were proposing new and special arrangements which would preclude the Company exercising their statutory powers of laying gas-mains in the road, and limit them in a way which the Board thought most unfair. They, therefore, felt it to be their duty to oppose the County Council. But unfortunately they were unsuccessful. This being so, they would have to do the best they could to meet the consumption of gas which they hoped to get along this new road, which would extend some five miles through the Company's district.

PENSIONS.

There was a small increase in the amount of the pensions, which was due to some of the older servants taking their well-earned rest. One of the men at Brentford, at the age of 70, had only recently taken his pension, after nearly sixty years' service with the Company; and he carried with him into his retirement the best wishes of all.

A BRISK EXTENSION OF BUSINESS.

Turning to the other side of the revenue account, the sales of gas showed an increase of £10,403, or 5·3 per cent. The actual increase in the volume of gas sold amounted to 130 million cubic feet, or 7·42 per cent., which was about the largest increase ever known in the history of the Company. There was, he believed, one occasion when they did get a larger increase; but that was owing to the coal strike. The increase in the past half year was much more favourable than that due to the coal strike, because it was owing to the normal increase in the business, due to the progressive policy the Company had adopted in supplying consumers with gas-consuming apparatus upon favourable terms. When the report was sent out, they were hoping that this increase would be of a permanent character; but they could not yet say what would be the effect of the exceptional circumstances that had since arisen. The meter and stove rental showed an increase of £3777, which again afforded an indication of the continuous growth in the Company's business. During the half year, 2191 new meters had been connected; and more than 5000 new stoves and other apparatus, which meant practically 192 per week, had been fitted—the demands upon them in this direction being still most brisk.

THE RESIDUAL MARKETS.

The only real trouble the Company had had had been with regard to residual products. There had been a decrease in this department of their business over which the Board and their officers had no control whatever. The difficulty had chiefly centred in the coke market. He thought, however, the probability was that an excellent market would be found for their coke in the immediate future, because it was likely that coke would largely supersede coal in the district, owing to the difficulties there might be of getting coal supplies by sea.

COAL AND OIL STOCK.

Another gratifying feature was that the Company had a better stock of coal on their premises than they had ever had. It was equal to twenty-six weeks' requirements; and their stock of oil was equal to thirteen weeks' needs. They had, therefore, a fine supply to draw upon in case of shortage or any difficulties that might arise in transport. At the Brentford works, they had also a stock of about 8000 tons of coal, as well as a good stock of oil. They had not been caught napping at this critical time.

NEW WORKS AND THE FUTURE.

During the half year, there had been a great deal of profitable work going on. New purifiers which they had been laying down at Southall were approaching completion. This would enable them to largely increase the output of gas in the coming winter. They were also installing a section of vertical retorts at Southall; and these, too, ought to be finished in time to meet any demands made upon them during the winter. Of course, it was impossible to say anything with regard to the future. He did not propose to do so; but he thought he might say that the Company found itself, considering all the circumstances of the present time, in an extremely fortunate position in regard to the raw material which was the basis of their industry.

THE COMPANY'S NEW ACT.

The Bill the Company promoted in this session of Parliament had received the Royal Assent. It was an important Act indeed for the Company; and he believed they would derive a great deal of advantage from it. The first part of the Act, and the important part from the proprietors' point of view, referred to the conversion of the stock. The stock had been unwieldy for a long time, standing at a high premium; and the consequence was there had not been a very good market for it. People who knew the strength of the Company, and how good were the dividends, had been buyers; but the ordinary investor did not like to pay £260 or more for the consolidated stock, or £206 for the new 1881 stock. Under the new conversion scheme, the stockholders would not have their position altered in the slightest degree, excepting that the holders of the existing 10 per cent. consolidated stock would receive in exchange for it two-and-a-half times the amount of consolidated "A" 4 per cent. stock. The holders of £100 of 7 per cent. stock would receive £200 of "B" 3½ per cent. consolidated stock. The dividend received would be precisely the same as now, with these further advantages—that the dividend would be increased on a half-year's reduction in the price of gas, instead of on a year's reduction as now, and the stock would be more marketable. Then the Company had taken over a large area adjoining their district—that of the Staines and Egham Gas Company, which was a successful little Company doing very well according to its lights, and with its works on the river. They were also taking over the Sunbury Gas Consumers' Company, which was a smaller concern. But the two together gave them an additional area of some 41 square miles, making the area of the Brentford Company practically 90 square miles. The Board thought they could see their way to largely enhance the prosperity of the Company by extending the advantage of the cheaper gas made at Southall and Brentford to these districts. The present prices in parts of the districts were high; but an arrangement had now been made, whereby they would reduce the prices until eventually they were in conformity with the Brentford price. Another power they had secured was the taking over, subject to certain consents, of electrical undertakings in their supply area. It was not proposed to acquire any electrical undertaking which was not likely to be successful. But they had been empowered to take such concerns over from municipalities, some of whom were running them—he would not say at a loss, but on lines which made it uncertain as to whether there was upon them loss or gain. The Board thought they might have opportunities of acquiring some of these electrical undertakings to the great advantage of the Company. They would be able to supply the motive power from their own gas-works, and so would be able to derive economies in generation, as well as in other directions. Authorization had also been secured with regard to the supply of power gas, which they hoped to be able to develop. There was an industrial area, quite close to the Southall works, to which power gas, it was believed, could be supplied. Then they had now the right to lay ancillary mains for the conveyance of oil for manufacturing purposes. Now the Company had also the right to form a special purposes fund, under which they might set aside certain sums from the revenue for the payment of future dividends, for meeting special expenses incurred by reason of accidents, strikes, lock-outs, or circumstances that due care and management could not prevent, or for replacing or removing plant or works other than those requisite for ordinary maintenance and renewal. There was a clause giving the Board power to issue stock at a discount, if necessary; but he hoped they would not have to use it, excepting under very extraordinary circumstances. The illuminating power test had now disappeared; and they had a calorific power one. The new Act would bring the Brentford Company into line with the most progressive of gas companies. It was, of course, a great disappointment to them that the Company did not succeed in regard to the proposed new site for works. Under their scheme, they would have been able to take certain meadows on the banks of the Thames, which lands would have been extremely useful and convenient for works purposes. Unfortunately the local opponents—greatly to their own disappointment now from the rateable point of view—were successful in preventing the acquisition of this the best site for the Company's purposes in their district. But in all other respects, the Company had an Act which would be to the advantage of their undertaking.

THE WAR AND THE COMPANY'S MEN.

With regard to the war, he felt certain, every proprietor would be proud to learn of the number of reservists, territorials, and volunteers of the Company who were going to have the honour of helping to represent the country in the present terrible war, which they were all thinking about, and in regard to which all would do their level-best to render help. [Hear, hear.] Between 250 and 300 men from the Company had joined the colours. The Directors were, of course, going to deal (and he was sure that every stockholder would approve of this) generously with the men who were going to the front, and who were leaving behind wives, children, and other dependents. Apart from any moral obligation, if for no other reason than that if the country did not succeed the Company could not succeed, they must do this. So the Directors were going to make it comfortable for those who were left behind by their men who were going to face dangers for their country. He had a meeting at Brentford the previous day, at which he promised the men that the Company would look after the wives, children, and dependents. It was a most enthusiastic meeting; and if the spirit of the country was anything like the spirit of the Brentford Company's men, then Germany had made a grave miscalculation. The Company might have their motors taken, and anything might happen; but they were going to do all they could to help the country in the hour of its need—even to money if necessary. He should like to read a letter from one of their pensioners, because it

instanced the pleasant relations that existed between them and their men. The letter read :

> Dear Sir,—Perhaps the Company may be short-handed, if you have men called up. I am too old to fight; but I shall be glad to help the Company in any way by returning to work in any position.

The letter was signed by their old employee, W. J. Rapkin; and his example had been followed by many other pensioners of the Company. The letter was an honour to the Company, and to the man who wrote it. [Hear, hear.] In conclusion, he might mention that Colonel Cowie (one of the members of the Board) was not present at the meeting for the best of reasons—that he and his two sons were away with the Army. [Cheers.]

Mr. R. Shafto Adair seconded the motion, which was unanimously carried.

The Chairman moved the declaration of dividends, at the following rates per annum, subject to income-tax: 5 per cent. on the 5 per cent. preference stock, 14 per cent. on the consolidated stock, and 11 per cent. on the new stock 1881. There was one point he should like to mention in this regard. The finances were no longer in the hands of the Company; the finances of the country were in the hands of the Chancellor of the Exchequer. There was not the slightest reason why the dividend should not be paid to the proprietors; but it would be understood that it was possible—though not likely—the country might want the use of the money. The dividend would be paid; but it might be delayed.

Mr. Adair seconded the motion, which was unanimously carried.

A vote of thanks having been passed to the Chairman and Directors, and to the officers (Mr. A. A. Johnston, the Engineer and Manager, and Mr. J. T. Croxford, the Secretary), their staffs, and the men,

The Chairman replied first on behalf of his colleagues and himself; and then, speaking of officers, staff, and men, said no Company was better served than their own by their staff and men of all ranks. The spirit of the men was perfect; and he hoped it might long remain so. Specially with regard to Mr. Johnston, he had spent an enormous amount of time in connection with their Bill, and with regard to the reorganization of the works that was going on—now most rapidly. They owed him and those under him a deep debt of gratitude for the splendid work that they had so loyally done on behalf of the fine old Brentford Company. [Applause.]

COMMERCIAL GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Company was held last Thursday, at the Cannon Street Hotel, E.C.—Mr. W. G. Bradshaw in the chair.

The Secretary (Mr. F. J. Bradfield) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The War—Right is Might.

The Chairman, in moving "That the report and accounts be received, adopted, and entered on the minutes," said: Ladies and gentlemen,—We meet this morning in solemn circumstances, such as have not been equalled in the life time of any of us. A war of unparalleled magnitude has suddenly, without warning, and without provocation, been forced upon an unwilling Continent by acts of international brigandage for which history has no parallel. No justification whatever can be found for the action of Germany, for neither her peace nor her interests were in any way threatened. She has proceeded on the fallacious principle that "Might is Right." But whatever the immediate issue of the struggle may be, sooner or later, as sure as there is a God who governs the affairs of men, it will be seen that it is, in fact, the converse of the proposition which is true—namely, that "Right is Might." The solemn warning uttered nearly 2000 years ago is still in force: "For all they that take the sword shall perish with the sword." And so, confident of the rightness and justness of our cause, we face the future a united people, undismayed and resolute to defend our country and our neighbours against wanton violence and aggression to the last drop of our blood, and to the last penny of our resources. [Cheers.]

A shortage of profit, but provision for securing an equilibrium.

When we had the pleasure of meeting you in February, almost the last words of my address in moving the adoption of the report and accounts were: "I am quite sure we shall not earn our full dividend this half year." This statement was not in the nature of a prophecy, because I had the essential facts before me at the time; but the accounts now before you indicate that it was accurate, for they show that our profits fall considerably short of the amount required to pay our statutory dividend. The history of the half year may be summed up in two short phrases—the high price of coal, and the diminished yield from residuals. When Parliament gave to the gas companies the sliding-scale, fixing a definite relationship between the price charged for gas and the rate of dividend authorized, it was not intended that the price of gas should be changed up or down every half year, or even every year, to meet variations in the cost of production; for this manifestly would have resulted in great inconvenience to consumers. But it was anticipated that gas companies would be so administered as to secure a general equilibrium with only a rare disturbance of the price of gas. Interpreting the intentions of Parliament in this way, we have gradually accumulated a sum of undivided profit amounting to £93,518; and this would enable us to face considerably reduced profit without any concern in normal times. Now in the altered state of affairs, we have carefully considered the position; and seeing that we shall have left, after paying the full dividend, a sum of nearly £80,000 on our balance carried forward, and nearly £40,000 (£39,689) on our reserve fund, and taking into consideration also that some of our stock is held by people to whom a reduction in the rate of dividend without due notice would cause great inconvenience, we have decided to recommend to you the payment of the full statutory dividend at the rate of £5 9s. 4d. per cent. on the 4 per cent. stock, and £5 6s. 8d. per cent. on the 3½ per cent. stock.

The position—developing the use of coke.

Now let me say a few words upon the position of the Company; and all my remarks must, of course, be taken as being subject to, and modified by, the unprecedented position of affairs in which we find ourselves neither by our own choice nor from our own fault. In the first place, the concern is in a thoroughly sound financial position, and is as well prepared for a period of adverse circumstances as it is possible for it to be, having regard to the conditions imposed upon us by Parliament and the Acts under which we work. Secondly, the business of the Company continues to show a satisfactory, if somewhat slow, progress. The increase in the sale of gas last half year amounted to 1·68 per cent., which is equivalent to an additional 28½ million cubic feet of gas sold, and in money to £3260. We have also fixed in the half year 80 additional ordinary meters, 1068 more coin meters, and 1889 gas-stoves. The difficulty of selling our coke through the ordinary channels which occurred during the last half year, and the fact that the cement companies, who have been accustomed to use large quantities, have, whether temporarily or permanently I do not know, reduced their use of coke, led us to look for other means of sale; and, although prices were depressed, we have to record a very gratifying development in the use of coke for industrial purposes in place of coal. Special efforts have been made to demonstrate to users of coal for engine purposes the economy and superiority of coke; and, as a result, we have obtained an increase in sale for these uses of between 30 and 40 per cent. This increase will in all probability lead to still further developments in the future. We have also substituted coke for coal in the furnaces of our steamers, and have thereby effected considerable economy in their running. As a result of these efforts, the stock of coke (which at one time during the half year reached large proportions) is now steadily being diminished. Thirdly, the larger sale of gas must to a great extent be attributed to the increasing use of it in factories for smelting, sugar-boiling, engine-driving, and other purposes. Burners and furnaces invented by a member of our own staff contributed to this result in a very satisfactory manner. I think I alluded last half year to the fact that we are now carrying coals to Stepney by steam-waggons from our Wapping works, which are reached by larger steamers carrying coal at a cheaper rate than the little steamers which run up the River Lea to our Poplar works. Formerly coal was transhipped into barges in the Regent's Canal Basin, and taken up the canal to the Stepney works, at a cost which rendered the use of the works almost prohibitive. Now these works have become as economical in their working as those at Poplar; and as there is a large amount of capital expended there, and they are in a very favourable position for distributing the gas which they manufacture, this is proving in an increasing degree to be a means of economy. Fourthly, the standard of working results, which has been constantly improving during recent years, has been well maintained. Indeed, the make of gas per ton of coal is larger than ever before; and there is an increased output of coke per ton in consequence of the installation of a larger number of regenerative furnaces. Fifthly, I am always glad to be able to refer to the cordial relations which exist between all ranks of the Company's employees. Some of our men have recently left owing to the mobilization of the British Forces; and we are making it our business to assist their families during their absence, and to welcome them back to the Company's service when peace is happily restored.

A comparison.

Coming to the accounts, and comparing them with the working results of the corresponding half of the year 1913, we find that the gross profit, which is £50,426 as compared with £72,929, is less by £22,503. The profit in June, 1913, was sufficient to pay the interest on loans and the full dividend, and left a balance of £8485. The profit this half year is short of the statutory dividend by £13,949. This is not such a serious matter as it looks, having regard to the fact that, in the last three years, we have added to the undivided profit carried forward no less a sum than £41,486. We are only allowed to do this on condition that we use it when necessary.

Causes of profit diminution.

Now you will wish to have a clear statement of the causes which resulted in this diminution of profit; and I have already given it you shortly as being the high price of coals and the low price of residual products. Coals cost more than in the corresponding half of last year by £14,247; but we expended £2296 less in the purchase of oil. Consequently, coals and oil together cost more by £11,951. Our residual products realized less by £12,346, which is made up as follows: Coke yielded less by £8714; breeze, less by £281; tar, less by £1373; and sulphate of ammonia, less by £1978. We spent £1824 more on distribution; but this, as I have explained on previous occasions, is practically met by the increased rental we are receiving from stoves and coin meters. Public lamps cost more by £444, because we were improving the service at the Tower Bridge, which now gives some of the finest gas lighting in the kingdom. Rates and taxes were more by £1385, of which £545 was due to increased poundage, and £825 to the heavy income-tax payable on the large profits of the year 1912. The increased expenditure and the diminished receipts to which I have alluded amount together to £25,440; and, as a small off-set to this, we had the increase in the sale of gas, which gave us £3155. Thus, with other unimportant variations, there is a difference, as compared with June, 1913, of £22,503. It is worthy of remark—it is, indeed, very striking—that coals, f.o.b. in the North, cost 53 per cent. more than two years ago; oil, 79 per cent. more; while coke realized 22 per cent. less than two years ago, and 37 per cent. less than last year. There is an explanation of the accounts, which speaks more eloquently than anything I can say. Thus you have a bird's-eye view of the working of the half year.

Coal and oil contracts.

When we made our contracts for the purchase of coal during the current year, we succeeded in obtaining reductions on last year's prices, which amounted, on the average, to rather more than 1s. 8½d. per ton.

But, as we had a considerable amount to take under our old contract, we did not feel the benefit of the reduction during last half year. In the current half year, we ought to obtain a reduction in the cost of coal of some £8500, and oil should show a saving of some £5500—affording together an apparent saving of £14,000. But we still carry somewhat large stocks of both coal and oil at the higher prices; and, therefore, we cannot expect a net saving of even as much as half this amount.

THE WAR AND ANXIETY.

How the working of the Company will be affected by the state of war, I do not think anyone can prophesy. All I can say is that we shall make every effort to keep adequately lighted the streets of that portion of the Metropolis which this Company serve, and to supply our consumers with gas for lighting, heating, and power purposes. But there are forces at work which are more powerful than we; and I confess that we have to look forward to the future with anxiety. I am glad to say that, although the war has come upon us suddenly and unexpectedly, we have considerable stocks of coal and oil, sufficient to last at the present rate of consumption for some two months. The Government have, as you will have seen in the papers, decided to ensure 80 per cent. of the value of ships against war risks; and it is probable that our steamers will be able to continue running under cover of the British Fleet.

INCOME-TAX CORRECTION.

Only one other matter. The Inland Revenue Authorities have asked companies who have deducted income-tax at a rate other than the rate now settled—that is, 1s. 3d. as from April last—to refer to the matter in general meeting, stating that the correction will be made at the next payment of dividends and interest. The tax on dividends will, of course, be correct—1s. 2½d. (three months at 1s. 2d., and three months at 1s. 3d.). But on the debenture interest paid in June last, tax was deducted at 1s. 3d. (three months 1s. 2d., and three months at 1s. 4d.). To adjust this tax, next December ½d. per pound will be deducted from the rate then current. What this rate will be none of us can say.

The Deputy-Chairman (Mr. Walter Hunter), in seconding the motion, said the Chairman had, as usual, gone so thoroughly into the report and accounts that he had not left anything for anyone else to say. They were proud of the way Mr. Bradshaw conducted the affairs of the Company, and the lucid manner in which he explained everything to the proprietors at the half-yearly meetings. He (Mr. Hunter) would, however, like to say that he was perfectly certain all who had heard the Chairman joined cordially with him in the expressions he had used, and the feelings he had expressed, in regard to this most unfortunate and unjustifiable war. He believed our own nation had right on their side; and he trusted that God would give them the victory which right always deserved.

The motion was unanimously carried.

THE DIVIDENDS.

The Chairman next moved the declaration of a dividend for the half year at the rates of £5 9s. 4d. per cent. per annum upon the 4 per cent. stock, and £5 6s. 8d. per cent. per annum upon the 3½ per cent. stock, in both cases less income-tax, payable on Aug. 15. He added that the payment was being made a fortnight earlier than last year.

The Deputy-Chairman seconded the motion, which was carried unanimously.

GOOD SERVICE.

Mr. M'Naught proposed a vote of thanks to the Chairman and Directors. He remarked that the proprietors could not help recognizing the signal ability and outlook of the Chairman in the speech to which they had listened.

Mr. H. Johnson, in seconding, observed that he hoped the Chairman and Directors would receive every encouragement during the troublesome times which he felt were before them.

The motion was cordially agreed to.

The Chairman said he had to thank the proprietors, on behalf of his colleagues and himself, for the very kind terms in which the resolution had been moved and received. As they stood there that morning, they felt that they would probably, in the months to come, need all the encouragement and support the proprietors could give them. They were all Englishmen together; and they stood shoulder to shoulder. He thought one of the best phases of the last few days had been that, throughout the British Isles, differences had been forgotten; and they now presented a united front to the enemy of the world. If the Directors needed the encouragement and support of the proprietors, there were others who needed it even more. Their officers and their workmen would have to bear the brunt of whatever came. The Directors, however, would stand by them, and would do everything that they possibly could to uphold their hands. There was a time of stern work in front of them, and a time of anxiety; but he was happy to tell the proprietors that staff and workmen had in the past done everything as well as it could be done to enhance the security of the Company. He had not a single criticism to make. The tone and cordiality of all classes of the employees was everything the Board could desire. It was a great pleasure to meet the workmen, as he did somewhat frequently; and it was also a great pleasure to have anything to do with them, because he felt that their interests were bound up with those of the Company. He moved a hearty vote of thanks to their officers and men.

The Deputy-Chairman said he had much pleasure in seconding the motion; and he might suggest, as he did not like to give up the privilege of doing this, that his old friend, Mr. H. E. Jones, should say a few words.

Mr. H. E. Jones remarked that he had been challenged to speak in support of this vote of thanks. As his own son was concerned, this might be held to be a disqualification. In his own case, it certainly was not, because he could speak both as a father and as a Director; and he could say that a better man than their Engineer and General Manager hardly existed. Something happened only a few minutes before in the Board-room which showed the spirit that actuated their employees. A little chap—quite a lad—had volunteered to go to the front. He asked the Board to take care of his mother, and away he went. So long as the Company had servants animated by this spirit in a crisis, they had not much to fear.

The motion was heartily carried.

Mr. Stanley H. Jones said he had been very touched by the kind things that had been said of the staff and employees. They had a stiff job in front of them. Many of them would like to offer their services to their country in the fighting line; a good many of the employees had and would do so. But some of them had to stay behind to "look after the shop." The requirements of the general public had to receive attention, as well as the country's battles. The proprietors need have no anxiety as to the Company not going through the troubles before them as well as other industrial concerns.

Mr. Bradfield, on behalf of the clerical staff, said he could endorse all that Mr. Jones had said. He was sure he was voicing all their wishes when he said, they would do all they could to minimize the effect of the war upon the fortunes of the Company. As the Secretary of the Health and Benefit Societies, he frequently met committees of workmen; and he should like to state publicly that the more he saw of them, the more he liked them. They got on splendidly together; and he found them real good chaps. He was sure when he mentioned to them the passing of this vote, and the way it was received, the Committee would ask him to convey to the Board the determination of the men to do the best they could for the Company throughout the year.

TOTTENHAM DISTRICT LIGHT, HEAT, AND POWER COMPANY.

The Ordinary Annual General Meeting of the Company was held last Saturday, at the Gas-Works, Willoughby Lane, Tottenham—Sir Corbet Woodall, D.Sc., in the chair.

The Secretary (Mr. E. Topley) read the notice convening the meeting; and the report and accounts were taken as read.

THE EUROPEAN WAR.

The Chairman said, before any comments were made upon the accounts, he had to express to the proprietors the regret of their friend, Sir Daniel Goddard, M.P., that he was detained at home by inflammation of the eye. He (Sir Corbet) had also to ask the indulgence of the proprietors that day for himself, because, under very strict orders, he must not at present attempt public speaking. Therefore, he was going to ask the Secretary to be good enough to read the observations he had to make. But, before entering upon the business of the day, one could not, occupying the chair at such a meeting as this, avoid making some reference to the horrible international conditions under which they were now placed. Every aspect of one's life was affected by the terrible war which had broken out in Europe, and in which Great Britain unfortunately had to take part. He thought the people of this country might take some satisfaction to themselves that this was not a war of their own seeking, and that the country had not entered upon it until every possible effort had been made to avert it. He ventured to say this was not a people's war in any sense. This country's relations with the German nation had been close and friendly in a remarkable degree. With regard to the gas industry, there had been gatherings in the last few years in London and German towns, which had shown a degree of intimate friendship which would not soon be forgotten, and would make many of them feel deeply the condition of things which had now arisen. He was sure they would all pray that the old relations might soon be restored, never to be again broken. [Cheers.]

The Secretary then read the Chairman's prepared address, as follows:—

MANUFACTURING AND DISTRIBUTING RESULTS.

The fact that the accounts are the joint product of Tottenham and Enfield operations influences the comparison of working results obtained this year, as compared with last, in so many ways that it is difficult to make a very clear statement. We have had to continue gas making at the Ponder's End works of the late Enfield Company. We had hoped to have these closed by April; but owing to severe difficulties in laying the 24-inch connecting-main, the closing-down could not be effected until last week. The combined figures show that, with 406 tons less coal used, 28,393,000 cubic feet more gas were made, due to improved results at both works. The average make of gas per ton of coal was 13,148 cubic feet; being an increase of 477 cubic feet on the average of the combined works a years ago. A further improvement in the make per ton must result now that all our gas is being made at Tottenham. Owing to our fortunate position in regard to oil contracts, we had no need to add to the coke market difficulties by reducing the make of oil gas; and instead of reducing our own quantity of carburetted water gas, we made an additional 46,559,000 cubic feet. If this quantity of gas had been produced from coal, an additional 2500 tons of coke would have been put on an already over-loaded market. Our unaccounted-for gas appears to have gone up from 4·67 to 5·34 per cent. This, however, is somewhat uncertain, as the Enfield Company's indexing system ran into this half year; and, while it swelled the balance they handed over to us, it, at the same time, cut into this half-year's returns. We have no cause to fear that the unaccounted-for gas has really increased.

CAPITAL OUTLAY AND RAISING—CONSUMERS AS STOCKHOLDERS.

Turning to the accounts, and taking first the capital, the expenditure per million at Enfield having been very much greater than at Tottenham, that figure has risen on the present accounts, and now stands at £430. The figure on the combined accounts on Dec. 31, 1913, was £421, so that the increase on the half year has been but small. In view of the large amounts which in the near future will have to be spent on the new gasholder and other plant, we cannot hope to reduce this for a year or two. It will be seen that, though we have not yet commenced to give a supply of electricity, some capital expenditure has been incurred, and a separate capital account opened. During

the half year, an issue of £55,000 "B" stock was made, and evoked, as usual, a very satisfactory response; applications being received for £90,250. It is a gratifying feature of these issues that so large a proportion is taken by existing proprietors, and, perhaps more gratifying still, that so much is taken by the consumers of the Company's gas. In the recent issue, £25,665 of the £55,000, or over 50 per cent., was taken up by 183 of the present proprietors, and £27,615—again over 50 per cent.—by 232 customers of the Company, who thus give practical proof of their confidence in it, and their satisfaction with its methods and service.

REVENUE INCREASE IN THE GAS DEPARTMENT.

Coming to the figures of the revenue account, it is noticeable that, with a reduction of 1d. in the price of gas in the larger district of Tottenham, and 2d. to 5d. in the smaller district of Enfield, the return from gas shows an increase of £1117, and meter-rents £216; while stove-rents have also increased by £1222, and fittings rents by £340. The increase in gas sold in the Enfield district against the corresponding six months last year was 12·18 per cent. It is satisfactory to record that this is due not so much to new consumers as to an increase in the quantity of gas required by existing users. The quantity taken per ordinary meter consumer in the six months, excluding institutions and large consumers of that kind, rose by 314 cubic feet; while the consumption per coin meter rose 526 feet. The expectation that the reduction in price and the increased facilities offered would stimulate consumption has thus been amply justified.

RESIDUALS AND COKE SALES—A JUSTIFIABLE COMBINATION.

But now come the less gratifying figures: Coke is down by £3114. This is entirely due to the price, as the quantity in both years is about the same. We have already said there has been over-production. Owing to the mild weather, there has also been a less demand. Coke must be made. Its quantity is capable of regulation within certain limits by making carburetted water gas; but this year the influence of the high price of oil has operated generally against the curtailment of coke production. The result has been over-stocked coke yards; and in the rush to secure orders, coke has been sold by all London companies at prices far below its fuel value, and unfortunately the same system is still going on. The result is that, during the current half year, coke is not unlikely to show a still worse return. Combinations formed for creating artificial values for any commodity are to be heartily condemned; but in this case, a combination would surely be justified. Coke has a relative fuel value as compared with coal, but, owing to over-production, the relative value has not been obtained for it; and it is being sacrificed at prices far below its proper value, while so far few additional sales have been effected. The Smoke Abatement movement, which is now so popular in all great cities, ought to benefit from this. Coke is a smokeless as well as hot fuel, and no user can ignore its advantages when combined with its remarkably low price. Domestically, its use is little known; and it behoves gas companies to make its worth appreciated. If only people could be made to realize that an equal mixture of coke and coal will give them the charm of a coal blaze, and save them, at the same time, from the nuisance of soot in chimneys and kitchener flues, the smoke problem would be nearly solved. Few people, it is to be feared, really knew what coke is, and as few know that it can be obtained from their gas company at a low price. When one thinks of the large quantity of solid fuel used in each household in London every year, the smoke from which pollutes the atmosphere, one realizes the importance of advocating the admixture of coke with coal, or using it by itself when the chimney gives a sufficient draught. If only every house in a gas company's district used half a ton of coke per year, nearly the whole production would be absorbed. Sulphate of ammonia is disappointing. We have made more per ton—indeed, our production of 24·2 lbs. per ton of coal is really good; but the price has fallen heavily. This is largely due to the synthetic process of production in Germany. It is, however, doubtful if this will be extended now that it has brought down the price.

EXPENDITURE ON REVENUE ACCOUNT.

We now turn to the expenditure side of the account; and the first item nearly completes our record of adverse conditions. Notwithstanding the decreased quantity used, we have had to pay £5058 more for coal. The peak of price, however, has been reached; and prices are on the decline. Our present contracts show a reduction of 1s. 8d. per ton; but, of course, this will be to some extent discounted in the current half year by the expensive stocks brought forward. Although the oil used per 1000 cubic feet of carburetted water gas made remains the same, the increased quantity used, &c., and the increased price, represent an extra £1660. We have been very fortunate in regard to the price of oil; and although we have had to pay slightly more per gallon, we have not had to pay the enormous prices which have recently been experienced. Negotiations are now on foot which will ensure us a favourable position well into 1916. Notwithstanding the largely increased quantity of coke used for carburetted water gas, the cost is lower; but this is on account of the heavy fall in coke prices which we have had so much cause to regret. Purification shows a considerable reduction, owing to very successful working. Salaries also exhibit a reduction, due to amalgamation. The next item—that of wages—has increased. This is partly due to the larger quantity of gas made, and partly to the Company having granted eight-hour shifts at Tottenham, and increased pay at Ponder's End. Less has been spent on maintenance of plant by £6380; but, as our works are so well kept, we can well afford to exercise economy in this item in times of stress like the present. The item of wear and tear of mains, and those of stoves and coin-meter fittings, taken together, come out practically at the same cost per 1000 cubic feet as last year, and show that, in these items, we have maintained the liberal upkeep which has so long been our policy. In public lighting, once more we have to record the advantages gained by the automatic system. The cost per lamp for the half year, including redemption on a liberal scale, works out at 6s. 2¾d. Last half year the Tottenham figures averaged 5s. 5¾d.; making a total of 11s. 8d. per lamp per annum. As this includes all labour, materials (including mantles, glass, &c.), depreciation, interest, and amortization, it represents a saving of over 10s. per lamp per annum, as compared with the hand system. The charge for co-partnership shows a large increase, due to the reduction of 1d. in the price of gas, which carries with it an increase of ¾ per cent. in the bonus, and also to the fact that the Enfield bonus, which was only 4½ per cent., has now been increased to the Tottenham figure of 9 per cent.—needless to say to the very great content of the Enfield employees, who have become Tottenham co-partners. The co-partners' pension fund, which was established on Jan. 1, and which practically all the employees of the Company joined with enthusiam, is now well established. During the half year £2395 has been accumulated in the fund. The charge on the Company is considerable; but the fact that a substantial pension at the age of 65 will in the future be secured to all the Company's servants (in the case of a man who has spent forty years in the Company's service, two-thirds of his pay), must be a source of great satisfaction to the proprietors, as it is to the Directors and the employees. The charge on the revenue account for capital duty is for the stamp duty on Enfield capital taken over. There will be a further considerable charge for stamping the conveyance of the whole undertaking; but the amount has not yet been adjusted with the Inland Revenue authorities.

THE BALANCE AND THE RESERVES.

We have not quite earned our dividend during the half year; but the fluctuating balance of net revenue enables us to pay out of the "fat" years for this one, which is somewhat lean. This is the object of the undivided balance. This item has been reduced by charges due to amalgamation, which in themselves will lead to economies in the future; and in almost every way, financially and usefully, we may claim that the Company's position has been strengthened during the half year. This is well expressed and emphasized by the fact that, as compared with last year, we have 680 more ordinary consumers, and 2220 more coin-meter consumers, while the fires and cookers on hire have increased by 5495. The total reserves of the Company, including the undivided profit carried forward, now amount to just over £100,000.

ELECTRICITY SUPPLY.

With regard to the electric supply, we can only report that every effort has been used to get ready for an early service in Wood Green. Delays have taken place; but the generating station is nearing completion, and the cable-laying is well advanced. Many orders have been received from roads where it would not pay to run the cable; and we fear many will have to be disappointed. But herein lies the essential difference between gas and electricity. Gas has become an absolute necessity to the general public; and it pays to run mains almost everywhere. Electricity has fewer applications, and is still rather a luxury for those who can afford it. We are trying not to make the cost of current permanently dear by running cables in roads where there is no hope of ever getting a paying load. In the roads which it is proposed to cable immediately, the supply is expected to be available by the end of September.

THE GERMAN GASHOLDER CONTRACT.

A few words ought perhaps to be said with regard to the new gasholder which has been ordered from a German firm. Our hope was that an English firm would have quoted a price to enable us to keep the work in this country. But the prices quoted by the German firm showed a saving of £3500; and as the firm is one of the highest repute in the engineering world, we had no alternative but to give them the work. The design is our own; and the materials will all be in accordance with our specification, while the labour for erection will be practically all local. The deplorable and terrible war which now divides Europe into military camps must inevitably delay the completion of this work. It may involve the cancellation of the order.

The CHAIRMAN then formally moved the adoption of the report and accounts.

Mr. HENRY BAILEY seconded the motion, which was unanimously carried.

PRINCE OF WALES' RELIEF FUND.

Mr. CULL, the Chairman of the Edmonton District Council, called attention to the Prince of Wales' Relief Fund, and asked whether he (Mr. Cull) would be in order in moving that a sum of money be voted to this object.

The CHAIRMAN said, before this was done, he should like to make an explanation. Of the Company's employees, more than 100 had joined the colours. The Board had always desired to encourage the Territorial movement, and had done so to the best of their ability; and they were not going to shirk the incidental responsibilities attaching to their action in this matter. A notice had been, or would be, issued to the employees, to the effect that the Directors felt assured the shareholders would support, and would do all they could to mitigate any inconvenience or distress that might otherwise be caused to the wives and dependents of the men who went to serve their country. He need hardly say that this would involve a very considerable draft upon the revenue of the Company. [Hear, hear.] The question, therefore, was (it had been considered by the Board) whether or not, much as they would like to do so, they were quite warranted in going outside this call, and incurring further charges, They did not know how long the war would last. However long, or however short, a time it lasted, it would leave behind it serious interference with every citizen, including all those present at the meeting. Therefore, however strongly sympathetic they might feel with regard to the fund that had been formed, it must be borne in mind that the costs upon the Company might grow heavier and heavier, while the Company's power of meeting them would be reduced. If the proprietors would bear this in mind, the Board were perfectly willing to leave the matter in the hands of the meeting.

Mr. CULL moved, and Mr. W. BROWN seconded, that a grant of £500 be made to the Prince of Wales' Fund.

Mr. H. C. WELD suggested that the matter should be left to the Board, who had already considered the question; and Mr. MOORE supported this.

The CHAIRMAN added to his previous remarks that the number of the Company's men who volunteered for the front would no doubt increase as the days went on. The Board had agreed to pay to each married man who went into the country's service half of his wages to supplement the military pay, and the case of every dependent upon any man who was at the front would be individually considered by the Directors.

Mr. CULL said, in the circumstances, and with the consent of his seconder, he would alter the resolution; leaving it to the Directors as to whether or not they should do anything. But he should like something to be done.

The CHAIRMAN said he understood that the proposal it was desired that he should put to the meeting was that a contribution should be made to the Prince of Wales' Relief Fund, but that the amount of it should be left to the determination of the Directors. He added that the payment of half-wages meant practically full pay, taking into consideration the allowance to which he had referred.

In this form, the resolution was agreed to.

THE DIVIDEND.

Mr. JAMES RANDALL proposed the declaratian of dividends at the rates per annum of 5 per cent. on the preference stock, 7½ per cent. on the "A" stock, and 6 per cent. on the "B" stock. He remarked that this was an honestly earned dividend in every way. The Chairman had dealt with the upkeep of the works and other property, and had shown the care the Company took of the employees. The earnings of the half year—the amount of gross profit carried to the net revenue account—was £24,747, and the dividend amounted to £25,006. This showed £259 deficit. In addition, there had to be provided the interest on debenture stock, on deposits for gas, and on sundry funds and loans amounting to £4523. The difference came out of the undivided profits, which could well bear this comparatively small draft. Regarding the prospects, they appeared at the moment to be gloomy; but this was due to circumstances beyond the control of the Directors.

Mr. HENRY WOODALL seconded the motion.

The CHAIRMAN remarked that, had the meeting been held a fortnight earlier, it was quite possible the resolution might have been quite a different one. It seemed then that the Directors might have, at any rate, to defer the dividend, although they would not have deferred the declaration of it. The change, however, that had taken place the last three or four days, had made it quite certain that they were within the limits of prudence in agreeing to the payment of the dividend forthwith.

The motion was unanimously carried.

RE-ELECTIONS.

Mr. J. W. FORD, D.L., J.P., proposed the re-election of Sir Corbet Woodall as a Director of the Company, and referred to his inestimable services to the Company.

Mr. HERBERT MICHEL seconded the motion, which was carried with acclamation.

The CHAIRMAN, having responded, moved the re-election of Sir Daniel F. Goddard, M.P.

Mr. G. OSBORN seconded the motion; and it was unanimously agreed to.

Moved by Mr. MARSH, and seconded by Mr. A. W. REID, Mr. J. L. Chapman was re-elected an Auditor of the Company.

Mr. CHAPMAN, in acknowledging his re-election, said he wished to say how greatly he felt the loss of his old friend and fellow Auditor, Mr. Edward Crowne; and he should like to have it placed on record how much they felt the loss of his valuable services.

A NEW AUDITOR.

Mr. MICHEL moved the election as an Auditor, in place of the late Mr. Crowne, of Mr. John Eve. He stated that Mr. Eve had been personally known to him for more than twenty years. He proposed his election not only from personal regard, but because he believed he would be the right man in the right place. Mr. Eve was a member of the Chartered Institute of Secretaries and a Fellow of the London Association of Accountants, and he had a number of years' experience of the preparation of gas accounts in connection with a smaller Company. He was also a stockholder in the Tottenham Company.

Mr. BROWN seconded the motion, and it was supported by Mr. CULL and Mr. MARSH.

The CHAIRMAN paid a tribute to the work of the late Mr. Crowne, and spoke of the peculiar position which he occupied in being Clerk to the Tottenham District Council while serving the proprietors as an Auditor of the Company's accounts. Nevertheless Mr. Crowne faithfully performed his duty to both the Council and the Company. On the part of the Company, they had no objection whatever—quite the contrary—to having the chief officer of the Council going through their books and accounts in the most intimate manner. This being so, the Council must have been fully aware of the fact that there was nothing in the proceedings of the Company that was in the slightest degree inimical to the interests of the ratepayers. The relationship was also a singular tribute to Mr. Crowne himself. Passing from their late friend, it was a good thing to hear such tributes as they had had that day from men who had such a long acquaintance with, and knowledge of, Mr. Eve.

The motion was unanimously carried.

Mr. EVE sincerely thanked the proprietors for their confidence.

VOTES OF THANKS.

Moved by Mr. CULL, and seconded by Mr. GEORGE BELL, a cordial vote of thanks was passed to the Chairman and Directors, Auditor, and the officers, staff, and workmen.

The CHAIRMAN, on behalf of his colleagues and himself, thanked the proprietors for their hearty vote of thanks; and then he spoke of the earnestness and heartiness with which the officers threw themselves into their work. The way everybody, from the chief officers through all ranks, had pressed himself to do his best during these times of great strain was something for which they must all be grateful.

Mr. CHAPMAN briefly replied on behalf of himself; and Mr. BROADBERRY followed, on behalf of Mr. Topley and himself, their respective staffs, and the men.

Extraordinary General Meeting.

THE ISSUE OF NEW CAPITAL.

An Extraordinary General Meeting was then held for the purpose of considering and approving the raising of additional capital and the borrowing of a further sum of money by the issue of debenture stock.

Mr. J. L. CHAPMAN moved—

That the Directors be, and they are hereby, authorized, in accordance with the Tottenham and Edmonton Gas Act, 1906, to raise, by the creation and issue of "A" consolidated stock, "B" consolidated stock, or new preference stock, the sum of £374,288, being the balance of the sum of £600,000 authorized by section 20 of the said Act.

Also that the Directors be, and they are hereby, authorized, in accordance with the provisions of section 30 of the said Act, to borrow on mortgage of the undertaking of the Company, by the creation and issue of 4 per cent. debenture stock, any sums not exceeding in the whole one-third part of the portion at the time actually raised of the said £374,288.

And that the said "A" and "B" consolidated stocks, new preference stock, and 4 per cent. debenture stock be issued in such amounts, at such times, in such manner, and on such terms as the Directors may think advisable.

The motion having been seconded,

The CHAIRMAN mentioned that, of course, the capital would only be issued as and when required.

Mr. WELD remarked that the resolution involved the whole of the unissued capital; and the Chairman had intimated that this would not all be required at once. He wished to draw attention to this point. The present Board would not always be composed as now; and, with a changed constitution, the proprietors might not always entertain the same confidence as they possessed at the present time in the Directors. He thought that voting this authorization for the whole of the unissued capital was putting it out of the hands of present proprietors, or their successors, to exercise the power of the purse, which was sometimes an advisable power in the interests of a company.

The CHAIRMAN said he thought it was at the last meeting that he mentioned that the Company were engaged on the construction of works which, by the time they were finished, would have involved an expenditure of something like £250,000. This was for special works; and they had constantly going on a large ordinary expenditure in providing meters, stoves, and gas-consuming apparatus of that sort. These did not, of course, involve so large an expenditure as they would do if the whole of the outlay on them were put to capital, and if there was no amortization on account of depreciation. However, with an expenditure before them of a quarter of a million of money on works, it was not an unreasonable thing to ask for the amount named. They would, however, continue to exercise the greatest care over the capital expenditure. Probably the main cause of the success of the Company had been the care with which capital expenditure had been watched in the past. So long as he (the Chairman) sat at the Board, this policy would be, as far as possible, carried out. When occasion arose, they must go to Parliament again for more money; and he hoped that time would be soon, because this would mean that their business, instead of being hindered (as he felt it would be, in existing circumstances, for some time to come), was going on with its customary vigour.

The resolution was carried unanimously.

SOUTH SUBURBAN GAS COMPANY.

Half-Yearly Report and Accounts.

The following is the report of the Directors of the Company for the half year ended the 30th of June, which will be presented at the ordinary general meeting on Friday next.

The Company's Bill for the acquisition of land in Erith has passed through both Houses of Parliament, and has received the Royal Assent.

The exceptionally high prices paid for coal, coupled with a serious falling off in the returns for coke and sulphate of ammonia, have again compelled resort to the balance of undivided profit for the maintenance of statutory dividends.

Including the balance brought forward from last half year—namely, £7428 15s. 4d.—and after providing for debenture and other interest, the amount available for dividend is £34,852 2s. 1d., out of which the Directors recommend the payment of the full statutory dividends, as under: On the 5 per cent. preference stock, 5 per cent. per annum; on the 5 per cent. ordinary stock, 6 per cent. per annum; and on the 5 per cent. West Kent ordinary stock, 5½ per cent. per annum—carrying forward to next half year the reduced balance of £1280 15s. 1d.

Contracts for the current year's supplies of coal and oil have been made at substantial reductions from last year's prices.

The sales of gas show for the half year an increase of 7·30 per cent. as compared with those for the corresponding period of last year. The number of consumers was increased during the half year by 1688, and of cookers, fires, &c., in use by 2999.

Additional 5 per cent. debenture stock to the nominal value of £20,000 was sold by auction on the 30th of June last, at prices averaging £111 13s. 6d. per cent.

The vacancy on the Board which was created about two years ago by the death of Mr. Robert Morton has now been filled by the selection of Mr. Benjamin Robert Green, formerly Engineer and Manager of the late Mitcham and Wimbledon Gas Company, and also a Director of the late West Kent Gas Company.

The Company's new Act provides that the number of ordinary Directors shall not be more than eight nor less than five. It is accordingly proposed to increase the present number from six to seven; and the appointment at this meeting of Mr. Alexander Dickson as the additional Director would not only accord with the wish expressed at the last general meeting, but would, in the opinion of the Directors, be in the best interests of the Company.

It is particularly gratifying to the Directors, having regard not only to the period of exceptional stress through which the undertaking has been passing, but also to the feeling of unrest generally prevailing, to be able to bear testimony to the continued success of the co-partnership scheme as ensuring the good-will and co-operation of all classes of the Company's employees.

The accounts accompanying the report show that the total capital expenditure at the close of the half year (including the nominal amount

added by conversion) was £1,392,893 7s. 2d., or £7235 7s. 2d. less than the receipts—viz., £1,385,658, inclusive of the premium capital. A sum of £10,613 17s. 10d. was expended on capital account in the half year. The revenue from the sale of gas was £137,252; the rental of meters, stoves, and fittings, produced £18,354; the sale of residuals, £42,587; and the total receipts were £198,671. The following were the principal items of expenditure: Gas manufacture, £103,736; distribution, £37,533; management, £7352; rents, rates, and taxes, £8868; and miscellaneous items bringing up the total to £166,436. Among the items is one of £3572 charged on account of the co-partnership scheme. The balance carried to the net revenue account is £32,235; and the amount available for dividend is £34,852.

The statements as to working show that, under the supervision of Mr. S. Y. Shoubridge, the Engineer, 80,250 tons of coal were carbonized in the half year. The quantity of gas made was 1,159,214,000 cubic feet (118,480,000 cubic feet being oil gas), of which 1,109,029,000 cubic feet were sold and 1,121,137,000 cubic feet were accounted for. The residuals made were: Coke, 52,162 tons; breeze, 19,984 yards; tar, 756,123 gallons—the make of sulphate of ammonia being 888 tons.

NEXT YEAR'S EXAMINATION IN "GAS-FITTING."

The City and Guilds Syllabus.

In the notice of the programme of the City and Guilds of London Institute for the session 1914-15 which appeared in the "JOURNAL" last week, it was mentioned that in addition to the two subjects of "Gas Engineering" and "Gas Supply," an examination will be held in "Gas Fitting." Intending candidates will be interested to learn that it will include questions relating to the following subjects.

GRADE I.

1. *Introductory.*—Properties of gas. Regulations affecting gas supply, appliances, and meters.
2. *Meters.*—Size of connections. Fixing and reading of indices.
3. *Tools.*—All tools used by gas-fitters.
4. *Gas Pipes and Fittings.*—The composition and uses of iron, lead, copper, and brass piping and pipe fittings. Blown, screwed, and flanged joints.
5. *Gas-Burners.*—Description of flat-flame burners, regulators, governors, adjustable burners, incandescent burners with fixed and movable regulating nipples, bunsen tubes, mixing-chambers, air regulators. The effect of proper regulation on the illuminating power; the use of chimneys with incandescent burners.
6. *Gas-Cookers.*—Gas cookers, grillers, hot-plates, boiling-burners.
7. *Ventilation.*—Methods of ventilating by gas.

GRADE II.

1. *Meters.*—General construction of wet and dry meters.
2. *Gas Pipes and Fittings.*—Joints. Pipe laying, testing of pipes and fittings for soundness; apparatus to be used; the effect of pressure of gas and of length and cross-section of pipes on delivering capacity, having special regard to the number of burners supplied; description of all fittings to be used.
3. *Gas-Burners and Illumination.*—The distinction between various designs of shades and chimneys; effect of areas of opening on illuminating power; reflection; refraction, diffusion and concentration of light by shades and globes; effect of decoration in rooms on reflection of light.
4. *Gas-Cookers.*—Flue-pipes and fixing; regulation of draught; influence of cowls and hoods.
5. *High-Pressure Gas.*—Principles upon which increased efficiency is obtained; compressors and blowers; lamps and fittings.
6. *Ventilation.*—Diffusion of gases, and comparisons of air composition of occupied rooms lighted by gas and other illuminants.

FINAL EXAMINATION.

1. *Gas Pipes and Fittings.*—Consumers' complaints and their remedies.
2. *Mantles.*—Materials used in making incandescent mantles, methods of manufacture; collodionized and soft mantles and their relative advantages; effect of different forms of manufacture on durability.
3. *High-Pressure Gas.*—Systems of high-pressure lighting; advantages for trade purposes.
4. *Inside and Outside Shop Lighting.*—The construction of various types of lanterns for upright and inverted burners; types of burners, ventilation of closed-in windows; advertising signs.
5. *Distance Lighting.*—Description of the various systems; fixing precautions; faults and their remedies.
6. *Gas-Heating Appliances.*—Gas-fires; radiators (air and steam); convection and syphon stoves, geysers, circulators, hot-water systems, greenhouse, motor-shed, and workshop water-boilers and circulators as heated by gas; effect of radiant and convected heat on air and contents of room when heated by gas.
7. *Apparatus Used for Industrial Purposes.*
8. *Gas-Engines.*—Motive power; construction and maintenance; gas consumption per B.H.P. and I.H.P.; fixing of engines; locating faults; anti-pulsators and their use.

Remarks.

GRADES I. AND II.

Certificates.—No certificate will be awarded on the results of the examination in Grade I. until after the examination of the year 1916, candidates may take the examination in Grade II. without having previously passed in Grade I.; but, if so, they must produce evidence that they have served three years' apprenticeship to the trade. The examination in Grade II. will consist of a practical test of workmanship, followed by a written examination. Only those candidates will be eligible to sit for the written examination who have passed the practical test. Certificates will be awarded to those candidates only who pass both the written examination and the practical test.

Practical Examination.—To enable candidates to qualify for the written examination in Grade II., local practical examinations will be held prior to the written examination. A practical examination may be held in any town where there is a class registered by the Institute, or in such other places where arrangements can be made through the Local Secretary. The local examinations will be held under the personal supervision of examiners nominated by the District Associations affiliated to the Institution of Gas Engineers and the Trade Associations employing gas-fitters, subject to the approval of the Institute. The date at which a local examination is to be held may be fixed at any time between Feb. 8 and March 6, 1915, that may be arranged between the Secretary of the District Association and the Local Examiner, after consultation with the school authorities, provided that at least 14 days' notice is given to the Institute of the date fixed for such examination. The examination will be such as to test the candidate's ability in the making of blown, screwed, and flanged joints, adjustment of burners, fixing of appliances, and the running of pipes for internal fittings.

Written Examination.—The written examination will include questions on the subjects of the syllabus for Grade I. and knowledge will also be required of the subjects already indicated under Grade II.

FINAL EXAMINATION.

Candidates for the Final Examination must hold a certificate for Grade II., or, until after the examination of 1916, must produce evidence of their having served at least four years' apprenticeship to the trade.

Practical Test.—A practical test will be held at convenient centres, provided that arrangements can be made similar to those just described under Grade II., and will be of an advanced character, to test the candidate's ability to make any kind of joint, fix a gas cooker, fire, hot-water boiler or circulator, fix up a system of distance lighting, detect faults in gas-engine working, and execute in a satisfactory manner any piece of gas-fitting work. The examination will be conducted in a similar manner to the practical test in Grade II.

Written Examination.—All candidates for the final written examination must have passed the practical test in the same grade. In the Final Examination more difficult questions will be set in the subjects of the previous grades, and in addition a knowledge will be required of the subject already specified.

FEES.

The fee for the examination in Grade I. is 1s.; for the practical examination in Grade II., 2s. 6d., with no additional fee for the written examination; and for the final practical examination 3s. 6d., with no additional fee for the written examination.

WORKS OF REFERENCE.

"Handbook of Practical Gas-Fitting," by Walter Grafton (B. T. Batsford); "Self Instruction in Gas Supply," Elementary, by "Mentor" (John Allan and Co.); "Gas and Gas-Fittings," by H. F. Hills (Whittaker and Co.); "Gas-Fitting," by P. N. Hasluck (Cassell and Co.); "Practical Advice on Gas-Fitting," by R. Halkett (Walter King); "Ventilation, Lighting, and Heating," by W. H. Maxwell (Sanitary Publishing Company); "Distribution of Gas," by Walter Hole (Allan and Co.); "Air Currents and the Laws of Ventilation," by W. N. Shaw (Cambridge University Press).

Plymouth Water Undertaking.

The annual "fishing feast" of the Plymouth Corporation was observed last Wednesday week, when the Mayor and Corporation paid a visit to the water-works, and drank with the old-fashioned ceremonies to the memory of Sir Francis Drake, the founder of the water undertaking. In the course of the proceedings, attention was directed to a small experiment in planting the watershed with trees. A plantation of 19 acres was made 54 years ago, the trees planted being principally conifers; and these are now to be cut down. The outlay was £150; and it was pointed out that this, at 4 per cent., would now come to about £1200. The rates paid amounted to £75, and a nominal rent of 1s. an acre would add £50, giving a total cost of £1325. The timber will bring in only £800; so that, at the most liberal estimate, there will be a deficit of about £400. If the trees had matured in 35 years, the capitalized outlay would have been reduced by £500. Suggestions were made that the wrong kind of trees were planted, and that the whole of the watershed ought to be planted with Douglas fir. Alderman R. W. Winnicott (the Chairman of the Water Committee), in reviewing the position of the undertaking, stated that the past year had been one of steady progress. The gross income of the undertaking last year was £35,000, and the net profit handed over for the relief of rates £8172. They were greatly indebted to the staff generally, and more particularly to the Water Engineer (Mr. F. Howarth).

Cambridge University and Town Gaslight Company.—Proposing the adoption of the report at the half-yearly meeting, the Chairman (Mr. E. H. Parker) remarked that the proprietors met at a time of great public anxiety, and he did not propose to make a lengthy statement. The Directors were able to inform them that the Company was prospering under the able management of Mr. J. W. Auchterlonie (the Engineer) and his staff. The business was extending in all directions, and he was pleased to say that the coal contracts had been renewed at a reduced price per ton. In all probability the Company's men who belonged to the territorial force or to the army reserve would be called out in the next day or two. They had served the Company well; and he was sure that he was only expressing the sentiments of all when he said he wished them God-speed in the days that might be before them, and a safe return home. The Directors were glad to hear that the co-partnership scheme was working well, and appeared to be much appreciated. The report was adopted, and the payment of the maximum dividend agreed to.

SALFORD CORPORATION GAS SUPPLY.

Report of the Gas Committee.

The Salford Corporation Gas Committee, in presenting to the Council their report for the year ended March 31 last—a copy of which we have received from Mr. W. W. Woodward, the Gas Engineer—state that they have pleasure in recording that there has been a considerable increase in the number of consumers during the twelve months. The sales of gas have increased 4·03 per cent.

The coal and cannel carbonized during the year, the Committee state, amounted to 157,867 tons, and the quantity of gas made to 1,774,207,000 cubic feet, of an average illuminating power equal to 17·72 standard candles (the parliamentary standard being 14 candles). A contract has been let for the erection of an installation of continuously working vertical retorts at the Regent Road works. These retorts, which will be completed early next summer, will effect a great saving in the cost of carbonization, and will produce a larger yield of gas per ton of coal carbonized, while the operations will be carried on with absolute freedom from the production of smoke. The demand for gas appliances generally has been very satisfactory, and the business done has been much greater than in any previous year.

In consequence of the hiring-rates for gas cooking-stoves having been reduced to nominal amounts from March 31, 1913, the business in them has considerably increased. The total number on hire at March 31, 1913, was 6277; and by March 31, 1914, this figure had increased to 10,509. The increase is still continuing.

In January, 1914, the Committee commenced to supply gas-fires at a small rental. Considerable business has already resulted; and it is anticipated that there will be a continued demand for these appliances during the coming winter. In May last the Committee commenced, under certain conditions, to supply free of charge gas cooking-stoves with prepayment meters; and a large number of these stoves have already been fixed.

The Committee regret that the total receipts from the sale of residuals show a very large decrease compared with the previous year. The market prices of coke, tar, and sulphate of ammonia have fallen considerably, and unfortunately are still falling.

On April 1, 1913, concessions were made in the price of gas, &c., to consumers, involving a loss of revenue of over £20,000 per annum. Since these concessions were made, the Committee have had to pay a much higher price for coal and cannel; and this, in conjunction with the serious falling-off in the market value of residuals, has very materially reduced the profits of the undertaking for the year.

The coal market is, at present, in a most unsatisfactory condition; and consequently the Committee have decided to buy for a portion of a year only. Certain concessions in price have been obtained; but they are not sufficiently large to materially improve the prospects for the current year, when it is remembered that the market prices for residuals are still falling.

ROCHDALE PREPAYMENT METER CONSUMERS.

Special Committee to Consider Question of Price Reduction.

At the usual monthly meeting of the Rochdale Town Council, Mr. Davidson moved, in accordance with notice, that the Gas and Electricity Committee be instructed to consider the question of reducing the price charged for gas to slot-meter consumers, and to report thereon to the next meeting of the Council. The motion is the outcome of the questions which were put by Mr. Davidson to the Chairman of the Gas Committee (Mr. Walker) at the July Council meeting, when he stated that at the March quarter there were 3758 penny-in-the-slot gas-meters in use in the town; the total consumption through them being 28½ million cubic feet, and the revenue from this source £4426 per year. The price charged to these consumers was 3s. 1d. per 1000 cubic feet, as against 2s. 4d. for ordinary consumers and 2s. 1d. for large consumers for lighting purposes. His question was, Why were the poor people who used these meters—and many of them were very poor—charged 9d. per 1000 cubic feet, or 25 per cent., more than the well-to-do consumers, and 33 per cent. more than the large consumers? In other words, Why should these 3758 users of slot meters pay £1100 a year more than other classes of consumers for the same quantity of gas consumed, having regard to the fact that there were no bad debts, and cash was paid in advance? How could this be justified?

Mr. Davidson, in the course of a lengthy speech, said the Corporation had a monopoly in the supply of gas, and it was their duty to supply all classes at a fair and reasonable price. Gas was used by rich and poor alike for industrial and domestic purposes, and they had been forced to adopt what was known as a sliding-scale of charges; but they must take care that prices were so fixed in the scale as to be fair between the various classes of consumers. The charge to slot-meter consumers was 3s. 1d. per 1000 cubic feet, as against 2s. 4d. to ordinary consumers, and the Corporation were getting £1100 more from the prepayment consumers than from ordinary consumers and only supplying the same quantity of gas. The Corporation had made very large profits out of gas in past years—larger in proportion than had been made in many other Lancashire towns. Rochdale gave 27 cubic feet for 1d., and he compared this figure with other towns:

	Ordinary Meters. s. d.	Slot Meters. s. d.	Quantity Per Penny. Cub. Ft.
St. Helens	2 0	2 1	38
Oldham	1 11	2 3	37
Widnes	1 2	1 0	62
Manchester and Salford	2 1	2 4	36
Leeds	2 2	2 5	34
Burnley	2 1	2 6	33
Blackburn	2 9*	2 9	30

* Less 5 per cent.

The average quantity of gas for one penny was 38 cubic feet, as against 27 cubic feet in Rochdale. What could be done elsewhere could be done in Rochdale.

Mr. Wycherley, in seconding the motion, said he failed to see why the man at the bottom of the ladder should have to pay more in proportion than others.

Mr. Ogden, replying on behalf of the Chairman of the Gas Committee, who was away, said he did not think that the whole of the case had been viewed by the mover and seconder of the resolution. For instance, many of the poorer people were supplied through ordinary meters, and all the slot-meter consumers were not poor people. That the slot meters cost the Committee over £10,000 capital expenditure must be viewed in the light of a set-off against the £1100 extra charge mentioned; and presuming at least 10 per cent. for depreciation, £1000 was accounted for. This left only £100. The income per slot meter was 23s. 7d. per year. Prices of gas in other districts varied according to local circumstances, and it was unfair to bring in Widnes.

Alderman Sir J. E. Jones supported Mr. Ogden's statement. He added that the putting of a button or a token into a slot meter was something which ought not to be overlooked; every such incident cost the Committee 2s. As to the price of gas generally, he took it that if the Council were prepared to do without profits from the gas-works, the Committee were perfectly willing to see what was the lowest price at which they could supply. Then they would have to pay more at the other end.

The Mayor (Councillor Redfern), having stated that members of the Gas Committee apparently did not object to an inquiry being made into the matter,

Mr. Davidson said he was willing that the report should be forthcoming, not necessarily at the next meeting, but at an early date. Sir James Jones had mentioned the question of tampering with meters; but the reply to an official inquiry as to the sum lost from meters in Rochdale was *nil*.

The resolution, subject to the alteration of the time at which the report shall be due, was thereupon carried.

BURNLEY VERTICAL RETORT RESULTS.

At a Meeting of the Burnley Corporation Gas Committee the following report on the working of the Woodall-Duckham vertical retorts has been submitted by Mr. J. P. Leather, the Gas Engineer.

In accordance with the desire expressed at the last meeting of the Gas Committee, gas-making in the inclined retorts was entirely stopped during the Fair Holidays for seven days. The only retorts worked during this period were six vertical retorts. This was rendered possible by the manufacture of a larger proportion of carburetted water gas.

The quantity of coal used was gauged by arranging the deliveries so that the coal-store was filled to the same extent at the completion of the test as at the beginning. The illuminating power was taken each morning before running carburetted water gas out of the relief holder. The result was:

July 4 to 10 Inclusive.

Coal used	240 tons.
Coal gas made	3,084,000 cubic feet.
Make per ton	12,850 cubic feet.
Illuminating power	15·09 candles unenriched.

Weighings of the coke used in the furnaces were also taken, which show that only 11 per cent. of the coke made is required to heat the retorts. This is an exceedingly economical result, as the furnaces in the inclined retort house take from 17 to 18 per cent. of the coke produced.

The consideration of the report was deferred, and the Engineer was instructed to furnish further particulars.

PROPOSED EXTENSIONS AT CHORLEY.

At the last monthly meeting of the Chorley Town Council a letter was read from the Local Government Board stating that the method of construction of the proposed building for the vertical retort installation was not covered by the existing bye-laws. The Board, therefore, were not in a position to sanction a loan for the building and plant; but they would be prepared to consider a proposal to amend the bye-laws in such a manner as to allow of the erection of buildings of the kind in question. They enclosed a draft of a short series of bye-laws effecting such an amendment. It was resolved to make bye-laws under section 184 of the Public Health Act, 1875, which would allow of the erection of buildings of the kind in question.

At the same meeting, it was reported that the Local Government Board had given formal sanction to the borrowing of £1233 to defray the excess expenditure on meters and cookers, and £4800 and £5000 for the prospective expenditure on mains and services and meters and cookers respectively. The Board stated that the proposals with respect to the extensions at the gas-works were generally satisfactory, but pointed out, as stated above, that the method of construction of the proposed building in connection with the vertical retort installation was not covered by the existing bye-laws. With regard to the retaining wall in connection with a proposed condenser, the Board suggested that an ordinary retaining wall be built instead of one of reinforced brickwork, as proposed. The suggestion of the Board was adopted.

Littleborough Gas Company.—The Company report a slightly decreased profit on revenue account for the last half year, but are paying the usual 10 per cent. dividend. The profit amounted to £1384, as compared with £1577 in the corresponding period of 1913. At the meeting a year ago, it was reported that the gas sold showed an increase of 8 per cent. on the previous year, and was in excess of any previous record. The disposable balance this half year amounted to £3971, as against £3908 a year ago.

STOCKPORT CORPORATION GAS UNDERTAKING.

At the usual monthly meeting of the Stockport Town Council last week, the annual report of the Gas Engineer (Mr. S. Meunier) was adopted, on the motion of the Chairman of the Gas Committee (Mr. T. Winter, J.P.), who said the financial year in connection with the gas undertaking had not been so good. The only reason the Committee could give for this was the high price of coal and the decreased amount received from residuals. As a consequence, the profits had been substantially reduced during the past year; but no blame could be attached to the Committee, nor was there any lack of duty on the part of the officials in the Gas Department. Members of the Council would have noticed the general reduction during the last two years in the profits of gas undertakings throughout the country. At Bradford, there was a loss of £865 on the Gas Department, and there had been a great decrease in the profits on gas at Rochdale and other large towns; so that Stockport compared favourably with other similar Corporations. He hoped to have a more favourable report next year; but no doubt the war would affect the gas undertaking as well as other departments, and they trusted it would be brought to a speedy close.

THE YEAR'S RESULTS.

Although the Gas Engineer has presented his reports on the working of the undertaking for the past year, they are not, says our Manchester correspondent, yet available for publication, but will be issued in a day or two. There is, however, a loss of between £9000 and £10,000 on the trading; but this is more than accounted for by the payment of £6000 extra for coal, the decreased yield from the residuals, and the labour troubles.

PRICE OF GAS AT CHORLEY.

At the last meeting of the Chorley Town Council, Mr. Sandham returned to the subject of the price of gas. He moved that "an additional discount of 1d. per 1000 cubic feet be allowed to all ordinary consumers, and an additional number of cubic feet equivalent to 1d. per 1000 cubic feet to users of automatic meters from July 1. He said this would amount to £455. The profits last year were £1386, so they would still have £931 left. Allowing £100 for a reduction in the price of bye-products left a sum of £831. In addition, they must notice that the estimated saving upon fuel for nine months was £400. This would bring the gas profits to £1200. Surely, on the grounds of finance, he need not put further arguments forward to show that the Gas Committee could afford it? As to whether the consumers had a right to a reduction, he had often argued before, and he argued again, that they had no right to be charged a monopoly price. The motion having been seconded, Mr. E. W. Heald (the Chairman of the Gas Committee) said he and the Gas Manager (Mr. J. W. Allin) had gone into the matter fully, and if they could have seen their way to reduce the price of gas they would have done so. Some of Mr. Sandham's figures were right, and others were wrong. The total reduction would amount to £623. There would be a saving of £400 in fuel, and it was estimated that they would have to pay over £500 more in interest and sinking fund than last year. Mr. Sandham had mentioned £100 less in the income from residuals; but if he multiplied this by four he would still be a long way from the mark. According to what they calculated, there would be a net profit of £607, and a saving of £400 in fuel would make the amount £1000. They were not going to make as much gas this coming winter as they did last. Everyone knew the state of trade, and mills were shutting-down. If they could see their way to reduce the price of gas next year they would do so by 2d. per 1000 cubic feet. It was playing with the subject to reduce it 1d.

The motion was lost; only the proposer and seconder voting for it.

TIPTON GAS UNDERTAKING.

A Year's Profits—The Resignation of the Engineer and Manager.

The annual report of the gas undertaking of the Tipton Urban District Council, which has just been issued by the Engineer and Manager (Mr. S. O. Stephenson) sets forth that the amount received from the sales of gas for the past financial year was £17,123, compared with £16,052 in 1912-13; and there was a net profit of £2742. If it had not been for the high price of coal and other difficulties, this would have been more like £3500. Of the profits, £1500 would be absorbed in connection with the extensions.

Mr. Stephenson sent to the Gas Committee a letter in which he expressed his regret at tendering his resignation, having accepted the appointment of Engineer and General Manager of the Worthing Gas Company. He thanked the Committee for the cordial relations which had existed between them and himself, and for the consideration and courtesy extended to him during the time he had held his appointment, and especially for the support and assistance he had received from the three Chairmen with whom he had had the pleasure of working. He trusted the Committee would be successful in appointing a successor who would carry on the management of the gas undertaking with the fullest possible measure of prosperity and success.

Mr. W. A. ROBBINS, the Chairman of the Committee, in bringing the letter before the District Council, said the matter had come upon them like a bombshell. He regretted that they could not afford to pay Mr. Stephenson such a salary as would ensure their retaining his services at Tipton.

Mr. STEPHENSON, who was present at the meeting, explained, in compliance with a request, that the Worthing Gas Company were rebuilding their works, and that they had offered him the position of Engineer and General Manager at a considerably higher salary than he was receiving.

The Council accepted the resignation, and generally united in an expression of appreciation of Mr. Stephenson's valuable services, and regret at losing them. It was decided to place this on record.

GAS v. ELECTRICITY AT REIGATE.

At a recent meeting of the Reigate Town Council, a recommendation from the Highways Committee was considered to the effect that the terms of the Redhill Gas Company, for a contract for public lighting for a term of five years, at £3 per lamp for ordinary lamps, and £3 2s. 6d. per lamp for Marriage's suspension arrangement, should be accepted, provided the Company will consent to the Council converting fifteen lamps each year during the contract period, without any penalty. Should the Company not accept the Council's stipulation, it is proposed to ask for terms for supplying gas to the public lamps by meter. The recommendation also contained a provision to the effect that the Reigate Gas Company should be offered the same terms.

Speaking on the recommendation, the Mayor (Mr. G. Ince) said it had been suggested, as a means of bringing about an amicable understanding, that a conference of representatives of the Gas Companies and the Town Council should be held; but the Redhill Company refused to have anything to do with the proposal. It was not until 1911 that any conversions of the street-lamps to electricity took place. Up to that time the Council's contract provided that they should be at liberty to convert 25 per cent. of the existing gas-lamps during any year. Owing to opposition from the Companies, however, this amount was decreased to 15 lamps for each Company. The Companies were now demanding an increase of 4s. 6d. per lamp. The high price asked for by the Redhill Company was unwarranted. The arguments of the Company were, first, that their labour bill practically remained the same as it was when they had a larger number of lamps than at the present time. The Redhill lighting area was practically the same as in 1896; so this argument fell to the ground. The other argument was that the residual products revenue was not so good as formerly; but this was a matter which did not concern the Council. If the receipts were not so good, this was a thing which the Company ought to have taken into account when they were reducing the price of gas to ordinary consumers. The real reason was that for some considerable time the Council had been trying to develop their own electric light undertaking. The Gas Company had to enter into active competition, and were seeking by unfair means to "throttle the Council's own industry." The powers the Council had, so far as the Redhill Company were concerned, were very strong. The Council could adopt alternative means of lighting. That was to say, instead of the Company lighting, extinguishing, and maintaining the public lamps, the Council could ask them to give them a supply of gas only; and there was the power to get the price fixed by arbitration. With regard to the Reigate Company, the position was entirely different, and the Council's position with regard to them was infinitely stronger.

Alderman Barnes said that as the Redhill Company gained more than the Reigate Company, the latter should be treated leniently; and he moved an amendment that with the Reigate Company only ten instead of fifteen lamps be converted.

This was carried.

HORSTMANN CONTROLLERS FOR WEST BROMWICH.

After a lengthy test of various systems of automatic lighting, both before and since his appointment at West Bromwich, Mr. W. H. Johns, the Engineer and Manager, has recommended his Council to adopt a complete installation of Horstmann controllers —namely, 1100. The recommendation was confirmed at the Council meeting on the 29th ult.

The type of controller decided upon is the "Horstmann Type 3/EP." with hand adjustment, and is provided with a device for cutting out the pilot during lighting hours—a new patent for which has just been applied for. This device performs the following cycle of operations: At lighting time the light is turned on instantaneously with a powerful operation, being lit by the pilot which is then burning. Within a quarter-of-an-hour from this time, the pilot is instantaneously extinguished, and remains out during the lighting hours of night. About fifteen minutes before extinguishing time, the pilot is again turned on, thus leaving ample time to re-ignite from the main flame, which is then extinguished, leaving the pilot burning during daylight.

The bye-pass to be used on this installation is the Horstmann patent atmospheric pilot, with jewelled orifice, and with storm-proof tip, the consumption of which will not exceed ½ cubic foot per hour at 2 inches pressure. Mr. Johns anticipates effecting considerable economies in his public lighting by the installation of these controllers and bye-passes, which he regards as the most economical combination extant. The cases and covers are to be extra substantial to stand the atmospheric conditions of the neighbourhood. We understand the instruments are to be guaranteed by the Hortsmann Company for a period of 25 (or 15) years, under their "A" (or "B") maintenance contract.

Stoppage of Coke-Ovens near Maryport.—Bye-product coke-ovens to the number of forty, owned by the Flimby Company, at Risehow, near Maryport, have been damped-down during the past week, owing to the closing of the Company's pit at Watergate a fortnight ago. Over 100 men are affected, in addition to the 300 at Watergate. It is stated that the stoppage of the ovens will seriously affect the adjoining West Cumberland bye-product works, which closed last week-end—Cumberland miners' holiday week—owing to the scarcity of tar.

Chester United Gas Company.—At the meeting of this Company last Thursday, the Directors reported that the balance to the credit of the profit and loss account for the six months ended the 30th of June was £5231; and they recommended the declaration of an interim dividend on the ordinary stock at the rate of 2½ per cent. in respect of the half year. The quantity of gas sold by meter within the city was 107,211,310 cubic feet; beyond the city, 32,723,440 cubic feet; and for public lighting, 1,911,400 cubic feet—producing a revenue of £17,348, compared with £16,400 in the first half of last year.

INCREASED GAS STORAGE FOR WALSALL.

New Holder to be Erected.

The Walsall Town Council have received and approved of a report from the Gas Committee with regard to the unsatisfactory state of a holder at the Pleck Gas-Works. The holder was constructed in the year 1897-8, before the appointment of the present Engineer and Manager (Mr. B. W. Smith), at a cost of £6385. Some months ago, the Committee gave instructions to Messrs. C. & W. Walker, Limited, to look into the matter; and their report was of such a character that the Committee requested Mr. F. S. Cripps to inspect the holder. He duly presented a report, and the Committee, in view of the circumstances set out in the reports, came to the conclusion that it would be better to replace the holder in question by a new one of the latest design and construction than spend the large amount required to carry out the extensive repairs to the present holder indicated by Mr. Cripps to be necessary. The Committee therefore submitted to the Council a recommendation that a new holder should be erected on the same site as the one reported upon, at an estimated cost of £9000. The Gas Engineer and Manager will superintend the erection of the new holder; but Mr. Cripps has been asked to prepare the necessary plans and specifications in connection with the work.

STEEL PIPES AT HOME AND ABROAD.

[From a Scottish Correspondent.]

Extensive orders are just now being booked by Scotch firms who manufacture light steel pipes for gas-mains and water-supply mains. One of the largest firms in the trade, with various works in the West of Scotland, specialize in light lap-welded wrought-steel pipes with patent inserted joints for lead and yarn, and loose flange joints.

Particularly in the Colonies are the Scotch manufacturers doing a large trade; and thousands of tons of these patent steel pipes are shipped to South America and to Asiatic countries generally. In fact, all over the world, gas producers and corporations are making use of this modern system of laying mains. Immense quantities are shipped abroad; and recent orders show that steel pipes have proved the best for all classes of gas contracts. Train loads of patent steel pipes are sent off from the various Scotch works stacked in cargo liners' holds, and dispatched to all quarters. One large company alone who ship heavily abroad have two works in Glasgow, five in Coatbridge, three in Birmingham, and three elsewhere in Scotland.

About a dozen years ago, practically every gas-main throughout the country was of cast iron. To-day gas companies in most countries in the United Kingdom have either ordered steel pipes or are experimenting in this direction. Gas-mains underground are liable to all kinds of strain and stress; and therefore steel has the advantage over cast iron. Moreover the pipes are longer. One joint is only required for steel to every three for cast iron. In the workshops and stores of the Scotch firms, stacks of patent pipes are seen of all diameters—from ¼-inch upwards—ready for export; and that is testimony of the superiority in modern methods of steel over iron.

The average tensile strength of cast iron is only 7 tons per square inch, or about 27 per cent. of that of mild steel. The tensile strength of steel used by some firms in the manufacture of pipes is from 24 to 28 tons per square inch. Consequently wrought-steel mains may be laid nearer the surface of the ground than cast iron. They are therefore cheaper to lay than iron, and easier in many ways to handle, whether for home purposes or for large contracts in difficult countries abroad. In Colonial places—Melbourne, Sydney, Adelaide, Perth, Brisbane, Auckland, &c.—are to be seen extensive gas-mains of steel pipes imported from Scotland; and South Africa is also a buyer, not only for gas-mains, but all the leading centres of population have adopted steel water-mains, some of which have been in successful operation for a good many years. In the Argentine—more particularly Monte Video—steel pipes have been introduced in preference to iron where the existing system has had to be doubled or new mains laid; and this is proof of the hold that steel has acquired with experts in the trade. One Scotch firm, Messrs. Stewarts and Lloyds, Limited, have a wide connection in the Colonies and foreign countries, and find steel pipes in great demand for gas purposes.

The question of corrosion has excited much interest. It is understood that gas and most drinking waters have practically no corrosive influence upon iron or steel pipes from within. What is to be guarded against is the corrosive influence from without, and this depends on the class of soil, unless the pipes are protected. It is proved that the rate of corrosion is more rapid in the case of iron than in that of steel pipes. A safe and certain method of prevention is the dipping of the pipes in a solution before leaving the manufactory. This is an absolute safeguard, and experience has demonstrated that it is to be relied upon in all climates. Where the ground is particularly bad, the pipes are first dipped in the solution, then wrapped in hessian, and again recoated. This is easily done at the works, and enables the pipes to withstand any change of climate and the rough usage in shipping and quay handling. Reference may be made to the main of thirty miles of 30-inch lock-bar pipes for high-pressure gas laid in Staffordshire through heaps of slack and ashes, and maintained in a thorough state of preservation.

A feature of these new patent tubes manufactured by the butt-welded, lap-welded, and weldless processes is that the bill for contract work is lessened owing to the ease with which they are manipulated. Work can be carried out more rapidly than with any other class of pipe. The joints for ordinary purposes now much in use are inserted joint tubes with joints made by means of lead and yarn caulked tight in the usual way. But for pipes not exceeding 6-inch or 7-inch bore in ground subject to heavy road traffic or to subsidence, the "long sleeve" patent joint is the best.

Pipe lines for water run to great lengths in the Colonies and in foreign countries. One line in Australia is 360 miles in length, and traverses every description of country. One great advantage in the use of steel pipes is the cheapening of carriage, as steel is less than half the thickness of iron, and consequently the difference in weight represents a great economy on large contracts.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Aug.* 10.

Owing to the present state of public affairs, business in tar and ammonia products is practically suspended, and the prices generally are unaltered. Creosote has been sold at 4d. net per gallon in bulk; while the values of carbolic and cresylic acids have risen beyond an unremunerative point.

Tar and Tar Products in the Provinces.

Aug. 10.

It is very difficult to give correct prices for tar products under present conditions. In regard to 90 per cent. benzol, all sorts of prices are being mentioned for this article, and therefore it is very difficult to give an exact figure. The same remarks apply to naphtha and crude carbolic acid.

The average values during the week were: Tar, 25s. 3d. to 29s. 3d. Pitch, east coast, 33s. 6d. to 34s.; west coast, Manchester, 32s. to 33s.; Liverpool, 33s. to 34s.; Clyde, 33s. to 34s. Benzol, 50-90 per per cent., naked, North, 10d. Toluol, naked, North, 10d. to 10½d. Crude naphtha, in bulk, North, 4¼d. to 4½d. Creosote, in bulk, North, 3⅛d. to 3⅜d. Heavy oils, in bulk, 3⅞d. to 4⅛d. Naphthalene, £4 10s. to £10; salts, 55s. to 60s., bags included. Anthracene, "A" quality, 1½d. to 1¾d.; "B" quality, nominally ¾d. per unit, packages included and delivered.

From another source we learn that there is little or no business doing in sulphate of ammonia, and the values written at the present moment are purely nominal. Outside London, makes are quoted at £10 7s. 6d.; Hull, £10 17s. 6d.; Liverpool, £11; Leith, £11 to £11 2s. 6d.; Middlesbrough, £11.

Sulphate of Ammonia Prices in the Provinces.

Liverpool, *Aug.* 8.

Since the outbreak of hostilities on the Continent, there has been practically no business passing in this article, as it has been impossible to effect shipments. Prices can only be regarded as nominal, and are to-day given as £10 18s. 9d. per ton f.o.b. Hull, £11 per ton f.o.b. Liverpool, and £11 2s. 6d. f.o.b. Leith. The forward position has been quite neglected, both buyers and sellers preferring to await developments before committing themselves further.

Nitrate of Soda.

In consequence of the war, the spot quotations for this article have been advanced to 11s. 3d. per cwt. for ordinary, and 11s. 6d. for refined quality.

COAL TRADE REPORT.

Northern Coal Trade.

The coal trade of the North is still limited in volume. Coalowners cannot sell coal to the country which is usually our largest customer—Germany—and it is difficult to sell to some other nations, because of restricted credit and difficulty of sea carriage. Steam coals are thus being only slowly shipped. The price is nominally about 15s. 3d. per ton f.o.b. for best Northumbrians, and 12s. per ton for seconds; but these are nominal figures, and any sale is usually decided as to price by the time and shipment possible and allied conditions. In the gas coal trade, there is a little more being done, as the large southern contracts are now increasing in quantity asked for, and it is possible to load, though with the sea risk. As far as any price can be named, about 13s. per ton f.o.b. is current for best Durhams, and 11s. 9d. for seconds. It is noticeable that on Friday the Durham coalowners and miners agreed that the rate of wages which has prevailed during the last three months shall continue during the quarter now current. This will help to steady the value of gas coals, more especially if exports to countries such as Norway, on the one hand, and Italy on the other, should be arranged to continue. Coke is rather irregular, as a part of the export is interfered with. Prices are little altered. Gas coke is nominally about 12s. to 13s. per ton f.o.b. in the Tyne.

Lincoln Water Undertaking.—The Lincoln City Council agreed, at their meeting last Tuesday, to the Water Committee's recommendation that application should be made to the Local Government Board for sanction to borrow £7000 for extending water-mains during the next five years. It was explained that it had hitherto been the practice to defray the cost of such work out of revenue; but this was an inequitable arrangement, having regard to the fact that the mains lasted from thirty to forty years.

Newport (Mon.) Gas Company.—The half-yearly meeting was presided over by the Deputy-Chairman (Mr. T. G. Cartwright), who remarked that the net result of the six months' working was that there was a balance to profit of £8551, as compared with £9187 in the corresponding half of last year. The report was adopted and the usual 5 per cent. dividend was agreed to. Responding to a vote of thanks, the Secretary (Mr. T. H. Hazell) said it was satisfactory that the Company had doubled their business the last sixteen years, in spite of all competition. Alderman Thomas Canning (the Engineer) pointed out that the increase of 3½ per cent. in the sale of gas for the half year came on top of a 3½ per cent. increase in the corresponding six months.

Reduction in Price at Merthyr Tydfil.

The Directors of the Merthyr Tydfil Gas Company have reduced the price of gas by 2d. per 1000 cubic feet as from the date of reading the meters for the quarter ended June last. The charge is now 2s. 6d. to ordinary consumers, and there will be a proportionate reduction to those using prepayment meters and for the public lighting. The step is regarded locally as a bold and courageous one on the part of the Company; but it is believed that it will be fully justified by the results. This assumption is abundantly warranted by the progress of the Company. In the fourteen years during which Mr. J. E. Kenshole has been the Engineer and Manager, there have been five reductions in twelve years—from 3s. 4d. to 2s. 6d. in the town district, and from 3s. 8d. to 2s. 6d. in the districts of Cefn and Troedyrhiw. Under the Company's Act of 1906, however, the whole area of supply was placed upon a uniform footing, and the sliding-scale adopted. The reduction now announced will increase the dividend from 5⅛ to 5⅜ per cent.; and as a co-partnership scheme is in operation, the employees' bonus will be raised from 4 to 6 per cent. The present satisfactory position is characterized by a local paper as "a most creditable outcome of the enterprising spirit of the Directors and the careful management of Mr. Kenshole."

Gas Charges at Halifax.

At a meeting of the Halifax Town Council last week, there was considerable discussion on the gas charges which are prevalent in the town. This arose upon a minute of the Gas Committee recommending a revision of the gas charges. Alderman Morley said it seemed as if the Corporation were sinking their municipal administration to the level of special class legislation by the adoption of preferential charges, because by this method the poor would have to suffer. Councillor Waddington said that the Gas Committee had got to know of employers in the town who were wanting gas at a scale between 1s. 1d. and 1s. 11d. per 1000 cubic feet, and, in order to meet these requirements, had decided to make an intermediate charge of 1s. 8d. This would be profitable to the gas undertaking, and he thought that the Committee would not be doing their duty if they refused to take consumers on a profitable basis and allowed them to go somewhere else. The Committee were considering the reduction of charges for gas supplied for cooking and heating purposes. Councillor Redman said that consumers of gas for power purposes were not prepared to pay for gas at lighting rates. If an increased consumption of from 30 to 40 per cent. could be obtained, a great deal would be done towards reducing the loss which might arise by the reduction of prices for heating and cooking. Eventually the recommendations of the Committee were approved.

There has been forwarded by Weldless Chains, Limited, of Gartsherrie, Coatbridge, a copy of a new wall sheet which they are issuing, entitled the "Care of Chains and the Prevention of Accidents."

Fatal Accident at the Leek Gas-Works.

The unusual course of adjourning an inquest was taken last week by Mr. T. B. Cull, the Coroner, when an inquiry was held concerning the death of Albert D'Arcey, a fitter, who was badly burnt at the Leek Gas-Works on July 29, and died at the Leek Cottage Hospital early last week. Frederick Taylor Hilton, an exhauster attendant, said that on the date named the deceased and he were working in the carburettor-house on a back-pressure valve. The deceased took hold of the top of the valve, and they came outside because the fumes were too strong. After a few minutes D'Arcey went back, and there was an explosion. The deceased came out and was attended to by other workmen. He was burnt badly. He could not say what took place inside, but the fire would be caused by the benzol vapour coming in contact with the stove in the fitting shop, which was lit. There was a brick in the wall which had been taken out and put in again, and this was where the vapour got through to the stove. He did not know who removed the brick; but whoever it was did a risky thing. He did not know why it was done, unless there was not sufficient room to screw up a length of piping. Dr. Burnett said the deceased was burnt over both arms to the elbow, the neck, face, and scalp, and was suffering from shock. Death was due to septic pneumonia. Mr. R. H. Ginman, the Gas Engineer and Manager to the Council, said he had done his best to find the man who removed the brick, but had failed. The Coroner said he did not like to conclude the inquiry without some further evidence as to the removal of the brick, and he adjourned the inquiry until Saturday next.

Ottoman Gas Company, Limited.—The Directors' report for the half year ended June 30, to be presented to the shareholders at the ordinary general meeting on the 18th inst. states that the gas-rental for that period amounted to £27,830 (for the corresponding half year it was £23,585). The net profit is £4164, compared with £3748. The amount standing at the credit of the profit and loss account is £12,140; and the Directors recommend the payment of a dividend at the rate of 7 per cent. per annum on the preference shares (less income tax), and at the rate of 10 per cent. per annum on the ordinary shares (tax free), leaving a balance of £8647 to be carried forward.

Sutton (Notts.) Water Supply.—The needs of Sutton-in-Ashfield, in the matter of water supply, were brought under notice at a Local Government Board inquiry, held by Mr. H. S. Bidwell, last Tuesday. The inquiry was in relation to the District Council's application for leave to borrow £8500 for the purpose of duplicating plant and water-mains. There had, the Clerk explained, been a great increase in the demand for water; and additional facilities were now urgently needed to meet the requirements of the outside district. Mr. Hodson, the Engineer, stated that the water-works at Rushley were established in 1886, since which time various extensions had been made. In 1901, the Council were supplying a population of 32,582; and in 1911 a population of 43,637. There was no opposition to the application.

Stockport's New Carbonizing Plant.—In the printed minutes of the Stockport Corporation Gas Committee, it is reported that the Committee have visited Hyde, Oldham, and Darwen, to inspect different types of carbonizing plant, and that complete specifications and tenders were in course of preparation. A Special Committee was appointed to go into the tenders when received, and to report thereon to the Gas Committee.

Strike at Messrs. Clapham Bros.' Works Settled.—Intimation is made by Messrs. Clapham Bros., Limited, of Keighley, of the adjustment of the difficulty with their moulders, who, along with others in the district, have been out on strike during the past nine weeks. The terms of settlement were amicably arranged, and the men got to work last Tuesday morning. The three establishments of the firm are now in full operation, and the execution of orders is being pushed forward with all possible speed.

Grantham Gas Company.—Addressing the shareholders at the half-yearly meeting of the Grantham Gas Company, Mr. J. G. Thompson, J.P., said the Company had again broken the record as regards consumption of gas. The Directors' report stated that the first period of five years of the co-partnership scheme of the Company had been concluded; and this plan for the benefit and encouragement of the staff had been appreciated. A sum of £403 had been paid over in cash to the employees, and £623 remained invested with the Company for their benefit. The maximum dividend was declared, and a substantial balance carried forward.

Wandsworth, Wimbledon, and Epsom District Gas Company.—The accounts to be submitted to the shareholders at the meeting of this Company next Tuesday show a profit on the revenue account of £30,149 for the six months ended the 30th of June. The sum available for distribution is £34,431; and the Directors recommend dividends at the following statutory rates per cent. per annum: On the Wandsworth "A" stock, £8 7s. 6d.; "B" stock, £6 17s. 6d.; "C" stock, £5 17s. 3d.; on the Wimbledon stock, £6 2s. 6d.; on the Epsom stock, £6 12s. 6d.; and on the new ordinary stock, £5 17s. 3d. There was an increase of 7·9 per cent. on the sale of gas in the past six months compared with the corresponding period of the year 1913.

Bo'ness Gas Company.—The report adopted at the annual general meeting of the Company stated that, notwithstanding the heavy increase in the price of coal and the decreased receipts from coke, a very substantial profit had been made on the past year's working. The income amounted to £5593; and the expenditure (including allowance for depreciation) to £4872, leaving a balance of profit for the year of £720. Adding the sum brought forward (£856) gave for disposal a total of £1606. The Directors recommended a dividend of 6 per cent. free of income-tax, which would leave a balance of £758 to be carried forward. The make of gas still continued to increase; the total having now reached 32,212,000 cubic feet per annum. The Manager (Mr. James Campbell), in his annual report, said the make showed an increase of 1,918,000 cubic feet, or 6·33 per cent. Mr. Campbell was warmly complimented upon his efficient management of affairs.

Lurgan Gas Lighting.—At a meeting of the Lurgan Urban Council last week, the Clerk mentioned that he had written the Gas Company pointing out that two years ago they had promised a reduction in the price of public lighting for last year, but that, owing to the price of coal, the promise had not been kept. He reminded them that this year their coal contract had been placed at a lower rate. The Company wrote that they had, in view of the purchase of the gas-works by the Council, proposed to submit more advantageous terms, but that, owing to the risk arising over the European war crisis, they felt bound to maintain the present price. The Clerk expressed the view that they had little hope of a concession from the Company while they held control. It was decided to send a deputation to the Company in reference to the matter.

Airdrie Gas Undertaking.—At a meeting of the Airdrie Town Council last Thursday, the Convener of the Gas Committee (Bailie Goldie) submitted the annual statement of accounts of the gas undertaking for the year ending the 15th of May. The quantity of gas sold exceeded last year's total by 13,651,000 cubic feet, or 14·77 per cent. more. Notwithstanding this increase, the quantity of coal carbonized was slightly less, owing to the high average of 11,500 cubic feet of gas per ton of coal carbonized having been obtained. The unaccounted-for gas was reduced by 3·61 per cent. The total revenue amounted to £20,771; being an increase of £1139 over the previous year, which the Convener considered highly satisfactory, seeing that the price of gas was reduced 2d. per 1000 cubic feet, and that they had had a falling market for residual products. The total expenditure on revenue account amounted to £16,272, which includes £1305 this year for the first time for depreciation of stores and meters, and providing a reserve fund. The balance now available for meeting the standing charges was £4498, which, added to the amount carried forward, enabled these charges to be met with a surplus of £26. The Convener said the foregoing figures, in his opinion, reflected greatly to the credit of the management of the gas undertaking, when full consideration was given to the many adverse circumstances which had developed during the period to which they referred. It was decided to fix the price of gas as in the last three quarters of the past year.

The half-yearly report of the East Ardsley Gas Company shows that, on the six months ended June 30 last, there is a balance of £1703 to be dealt with. The Directors recommend that this should be allocated as follows: A dividend at the rate of 5 per cent. less tax on the preference shares; a dividend of 7 per cent. per annum free of tax on the original capital stock; and a carry-forward of £212.

One of the consequences of the tar-dressing of roads is to be found in the lament of water companies that their receipts from local authorities for road watering have been seriously reduced. The engineer to a water company supplying a suburban town of 20,000 inhabitants informed the "Sanitary Record" that at one time his Company drew £300 a year from the local authority for street watering, whereas now their payment is practically *nil*.

"VOLCANIC" (Powder). "VOLCUM" (Paste).

Andrew Stephenson,

Tel. Address:
"VOLCANISM, LONDON."

171, Palmerston House,
Old Broad Street,
LONDON, E.C.

LEST YE FORGET.

There was, it is reported, a failure of the electric light in Terminus Road, Eastbourne, last Thursday night. It was, of course, accompanied by the usual inconvenience to traders and others.

The British Del Monte Syndicate, Limited, has been registered with a capital of £9333, in £1 shares, to acquire and turn to account any mines, quarries, coal, or oil fields, &c.

Last week, at the invitation of the Chairman (Mr. W. S. Rowntree) and Mrs. Rowntree, the employees and lady friends of the Scarborough Gas Company were entertained at supper; about 240 accepting the invitation. One portion of the workers partook of the Chairman's hospitality on Tuesday; these being mainly the men engaged at the gas-works and the lamplighters. On Friday the remainder of the works men and the town staff, with the Directors of the Company, were entertained. On both days musical items were contributed by various employees at the conclusion of the suppers, and hearty votes of thanks were accorded to Mr. Rowntree for his generosity.

APPLICATIONS FOR LETTERS PATENT.

17,681.—Hall, I., "Burners." July 27.
17,687.—Green, H. J., "Gas-producers." July 27.
17,715.—Gee, B., and M'Intire, C. S., "Mixing air with gas." July 27.
17,864.—Tully, C. B., "Production of gas." July 28.
17,870.—Aktiebolaget Lux, "Automatically relighting unintentionally-extinguished gas-flames." July 28.
17,908.—Thorp, F. & H. T., "Cash-boxes for meters." July 29.
17,933.—Sauter, A., "Distilling coal." July 29.
18,085.—Corcoran, H., "Locking-device for gas-meter connections." July 31.
18,167.—Sörensen, A., "Gas-burners." July 31.
18,215.—Slocum, F. L., "Retorts." Aug. 1.
18,232.—Bergius, F., "Treating coal." Aug. 1.

GAS COMPANIES IN THE STOCK EXCHANGE.

The Stock Exchange has remained closed by order of the Committee since the termination of business on Thursday, the 30th of July. Consequently, since then no official business in stocks and shares has been transacted. But much else has been done which constitutes a distinct advance towards the reopening of the Exchange and resumption of business at a reasonably early date. The financial position of the country is so assured, the steady influx of gold is so progressive, and the public calm is so fully restored, that everything points to the fair promise of a sedate and perhaps even confident tone when the markets do reopen. At the same time, it would be well that they should start easy and with a very moderate degree of activity, and possibly with an initiatory stage of dealings for money only. It must be borne in mind that there will be no settlement until the 27th inst. (the normal mid-August settlement having been postponed); and it would be desirable that as little as possible should be added to the already existing proportions of the account. There is no scarcity of money; and there must be many in search of investments at recent prices who are quite prepared to buy for ready money. The course of the Money Market during the ten days which terminated last Saturday has been phenomenal. On Thursday, July 30, the Bank of England rate was raised from 3 to 4 per cent. On the Friday it was raised to 8 per cent.; and on Saturday, Aug. 1, it was raised to 10 per cent. But on the following Thursday the situation was so assured that the Bank Directors were not only in a position to lower the rate to 6 per cent. forthwith, but were seeing their way to a further reduction, which was achieved on Saturday in the form of a 5 per cent. rate. This speaks volumes for our financial strength and soundness.

OFFICIAL QUOTATIONS AT THE CLOSE OF THE WEEK.

Bank Rate (fixed Aug. 8), 5 per cent. Last year, 4½ per cent. Consols, —. Previous week, 69½—70½.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,551,868	Stk.	April 8	2½	Alliance & Dublin Ord.	59—64	..	3 18 2
374,000	,,	July 10	4	Do. 4 p.c. Deb.	76—79	..	5 1 3
280,000	5	April 29	7½	Bombay, Ltd.	5½—6½	..	5 17 8
50,000	10	Feb. 26	16	Bourne-mouth Gas and Water { 10 p.c. B 7 p.c. Pref. 6 p.c.	29—30	..	5 6 8
352,500	10	,,	7		15—15½	..	4 10 4
75,000	10	,,	6		13½—14	..	4 5 9
380,000	Stk.	Feb. 26	14	Brentford Consolidated	261—266	..	5 5 3
330,000	,,	,,	11	Do. New	204—209	..	5 5 3
50,000	,,	,,	5	Do. 5 p.c. Pref.	109—111	..	4 10 1
206,250	,,	June 11	4	Do. 4 p.c. Deb.	91—93	..	4 6 0
217,380	Stk.	Feb. 26	11	Brighton & Hove Orig.	208—213	..	5 3 4
244,200	,,	,,	8	Do. A Ord. Stk.	154—159	..	5 0 8
530,000	20	Mar. 26	12½	British	44—45	..	5 11 1
120,000	Stk.	June 26	4	Do. 4 p.c. Deb. Stk.	88—90	..	4 8 11
245,771	Stk.	June 26	4	Buenos Ayres 4 p.c. Deb.	85—87	..	4 12 0
100,000	10	—	—	Cape Town & Dis., Ltd.	1½—2½	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	4—6	..	—
100,000	Stk.	June 26	4½	Do. 4½ p.c. Deb. Stk.	70—75	..	6 0 0
157,150	Stk.	Feb. 26	5	Chester 5 p.c. Ord.	103—110	..	4 10 11
1,513,280	Stk.	Feb. 12	5/9/4	Commercial 4 p.c. Stk.	106—108	..	5 1 2
560,000	,,	,,	5½	Do. 3½ p.c. do.	103—105	..	5 1 6
475,000	,,	June 11	3	Do. 3 p.c. Deb. Stk.	69½—71½	..	4 3 11
800,000	Stk.	,,	4	Continental Union, Ltd.	76—79	..	5 1 3
200,000	,,	,,	7	Do. 7 p.c. Pref.	115—118	..	5 18 8
492,270	Stk.	—	6	Derby Con. Stk.	123—125	..	4 16 0
55,000	,,	—	4	Do. Deb. Stk.	102—104	..	3 16 11
1,002,180	10	July 29	10	European, Ltd.	17½—18*	..	5 11 1
16,362,910	Stk.	Feb. 12	4/17/4	Gas Light and Coke { 4 p.c. Ord. 3½ p.c. max. 4 p.c. Con. Pref. 3 p.c. Con. Deb.	98—102	..	4 15 6
2,600,000	,,	,,	3½		76—79	..	4 8 7
4,062,235	,,	,,	4		96—99	..	4 0 10
4,674,850	,,	June 11	3		72½—74½	..	4 0 6
258,740	Stk.	Mar. 12	5	Hastings & St. L. 3½ p.c.	87—89	..	5 12 4
70,000	10	April 29	11	Hongkong & China, Ltd.	16½—16⅝	..	6 11 4
131,000	Stk.	Mar. 12	7⅝	Ilford A and C	151—154	..	4 19 0
65,780	,,	,,	6⅛	Do. B	115—118	..	5 3 10
65,500	,,	June 26	4	Do. 4 p.c. Deb.	92—94	..	4 5 1
4,946,000	Stk.	May 14	9	Imperial Continental	150—160	..	5 12 6
1,235,000	Stk.	Feb. 12	3½	Do. 3½ p.c. Deb. Red.	84—86	..	4 1 5
200,342	Stk.	Mar. 12	6½	Lea Bridge Ord. 5 p.c.	119—121	..	5 7 5
561,000	Stk.	Feb. 26	10	Liverpool United A	211—213	..	4 13 11
718,100	,,	,,	7	Do. B	146—148	..	4 14 7
806,083	,,	June 26	4	Do. Deb. Stk.	97—99	..	4 0 10

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
75,000	5	June 11	6	Malta & Mediterranean	4½—4⅝	..	6 9 9
250,000	100	April 1	4½	Met. of Melbourne { 4½ p.c. Deb.	99—101	..	4 9 1
541,920	20	May 28	4	Monte Video, Ltd.	11½—12	..	6 13 4
1,775,892	Stk.	July 29	4½	Newc'tle&G'tesh'd Con.	98½—99½	..	4 10 6
529,705	Stk.	June 26	3½	Do. 3½ p.c. Deb.	82—83	..	4 4 10
55,940	10	Feb. 26	7/14/0	North Middlesex 7 p.c.	14—15	..	5 2 8
300,000	Stk.	May 14	8	Oriental, Ltd.	117—122	..	6 11 2
60,000	5	Mar. 26	10	Ottoman, Ltd.	7½—7⅝	..	6 9 0
60,000	50	Feb. 26	13	Portsea, Island B	128—131	..	4 19 3
100,000	50	,,	12	Do. C	118—121	..	4 19 2
249,980	5	April 29	8	Primitiva Ord.	5½—6	..	6 13 4
499,960	5	June 26	5	,, 5 p.c. Pref.	4⅝—5	..	5 0 0
521,600	100	June 2	4	,, 4 p.c. Deb.	91—93	..	4 6 0
346,198	Stk.	June 26	4	River Plate 4 p.c. Deb.	85—87	..	4 12 0
150,000	10	May 14	6	San Paulo { 6 p.c. Pref. 5 p.c. Deb.	10½—11	..	5 9 1
125,000	50	July 1	5		47—49	..	5 2 0
135,000	Stk.	Mar. 12	10	Sheffield A	223—224	..	4 9 3
209,984	,,	,,	10	Do. B	222—224	..	4 9 3
523,500	,,	,,	10	Do. C	220—222	..	4 10 1
90,000	10	May 28	9	South African	10½—11½	..	7 16 6
6,429,895	Stk.	Feb. 12	5/9/4	South Met., 4 p.c. Ord.	111—113	..	4 16 8
1,895,445	,,	July 10	3	Do. 3 p.c. Deb.	72½—74½	..	4 0 6
209,820	Stk.	Feb. 26	8½	South Shields Con. Stk.	157—159	..	5 6 11
952,795	Stk.	Feb. 26	6	S'th Suburb'n Ord. 5 p.c.	114—116	..	5 3 5
60,000	,,	,,	5	Do. 5 p.c. Pref.	110—112	..	4 9 3
137,058	,,	June 26	5	Do. 5 p.c. Deb. Stk.	116—118	..	4 4 9
629,740	Stk.	May 14	5	Southampton Ord.	99—102	..	4 18 0
120,000	Stk.	Feb. 12	7½†	Tottenham and District { A 5 p.c. B 3½ p.c. 4 p.c. Deb.	135—138	..	5 8 8
742,275	,,	,,	6†		115—117	..	5 2 7
181,255	,,	June 26	4		87—89	..	4 9 11
182,380	10	Dec. 30	5	Tuscan, Ltd.	5—6	..	8 6 8
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	93—95	..	5 5 3
236,476	Stk.	Mar. 12	5	Tynemouth, 5 p.c. max.	108½—109½	..	4 11 4
80,000	Stk.	Feb. 26	8⅜	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	151—156	..	5 7 4
255,636	,,	,,	6⅝	,, B 3½ p.c.	129—134	..	5 2 7
108,075	,,	,,	5/17/8	,, C 3½ p.c.	110—115	..	5 2 0
352,000	,,	,,	6½	Wimbledon 5 p.c.	117—122	..	5 0 5
98,000	,,	,,	6⅝	Epsom 5 p.c.	121—126	..	5 5 2
88,416	,,	June 26	3	3 p.c. Deb. Stk.	66—69	..	4 6 11

Prices marked * are "Ex Div." † Next Dividend will be at this rate.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

Engineer and Manager. Tipton Gas Department. Applications by Aug. 24.
Superintendent. Nottingham Gas Department. Applications by Aug. 17.
Working Gas Manager. Ware Gaslight Company.
General Foreman. Birmingham Gas Department.
Teachers—London County Council.
Gas Fitting (Aug. 19).
Elementary Science (Aug. 17).
Mechanical Drawing (Aug. 17).
Applications, by dates indicated, to the London County Council Education Offices, Victoria Embankment, W.C.
Works Foreman. Frodsham Gas Department.
Water Works Plumber and Fitter. Truro Water Company. Applications by Aug. 14.
Stoker. Ringwood Gas-Works.

Appointments Wanted.

Traveller or Salesman. Box 6758, Clarks, Great Portland Street, W.
Engineer and Chemist. No. 5923.

Gas-Works for Disposal (Oxfordshire).

C. Ryland Beeby and Co., 66, Basinghall Street, E.C.

Gas-Works Wanted.

"D. G.," c/o Scripps's Advertising Offices.

Meetings.

Chichester Gas Company. Gas-Works. Aug. 25. One o'clock.
Harrow and Stanmore Gas Company. Holborn Restaurant. Sept. 1. 12.30 o'clock.

TENDERS FOR

Coal.

Bradford Gas Department. Tenders by Aug. 31.
Haverfordwest Corporation. Tenders by Aug. 18.
Mossley Gas Department. Tenders by Aug. 26.
Ossett Gas Department. Tenders by Aug. 25.
Rotherham Gas Department. Tenders by Aug. 19.
Sligo Gaslight Company. Tenders by Aug 13.
Winsford Urban District Council. Tenders by Aug. 19.

Pipes, &c.

Marple Gas Department. Tenders by Aug. 19.